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# Backwoods



# Home magazine

practical ideas for self-reliant living

## What if...



## ...Terrorists got hold of NUKES

plus

See page 26

**Hunting morels**

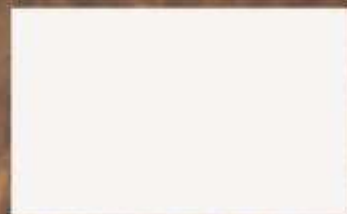
**Raised bed gardens**

**Harvesting the wild**

**Disaster preparations**

**Dual-purpose bomb shelters**

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**Backwoods Home Magazine** is written for people who have a desire to pursue personal independence, self sufficiency, and their dreams. It offers "how to" articles on owner-built housing, independent energy, gardening, health, self-employment, country living, and other topics related to an independent and self-reliant lifestyle.

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Every group needs a black sheep

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## ABOUT THE COVER

Jackie Clay shot the photograph for the cover in a high country meadow in Yellowstone in 2000. She and her husband go there every year to observe the elk in rut. They hiked in before dawn and caught the elk just as sun rose.

"It was cold," she said. "About 10 degrees. The elk was bugling. What you can't see, because they're lost in the fog, is a pack of wolves that howled back." She laughed. "What you also don't see is the hair on the back of my neck as it began to stand up."





## FEATURES

### Self-sufficiency

#### 14 Disaster preparation By Dr. Gary F. Arnet

If a major catastrophe happens, are you ready to deal with it? Most people have nothing in place to take care of themselves or their families during widespread disaster. And, as Dr. Arnet points out, despite vague promises by national or local leaders, you will be on your own. In his article Dr. Arnet provides you with an overview of what to expect and how to prepare for the worst.



#### 26 Nuclear terrorism By John Silveira

If terrorists get “the bomb,” the world is never going to be the same. John Silveira talks about how the bomb works, what happened in the two Japanese cities that experienced the bomb, what will happen in an American city if terrorists detonate one here, and the possible ways they may get their hands on one.

#### 37 Harvesting the wild By Jackie Clay

To Jackie Clay and her family, hunting is not just a sport, it’s a way of getting food. In this, the first of several articles, she tells us how she hunts deer, moose, and elk, how she field dresses them, then butchers and preserves the meat.



#### 48 Storing fuel By Rev. J.D. Hooker

#### 53 The return of home emergency shelters takes on a dual-purpose approach By Jeffrey R. Yago, P.E., CEM

There is no longer a national defense program in the United States. But Jeff Yago shows us that there are still ways the self-reliant can protect himself and his family in the event of a natural disaster or the unthinkable—nuclear war. Yago surveys the types of shelters a family can build or install, the accoutrements to look for, and how a shelter can serve other purposes if the bomb never falls or that tornado never comes.



### Farm and garden

#### 8 Grow, grow, grow By Alice Brantley Yeager

Whether times are good or bad, a garden can make you more secure.

#### 60 Raised bed gardening — neat and productive By Alice Brantley Yeager

Raised bed gardens are easy to create and can make gardening easier and more enjoyable.

#### 64 Raised beds, concrete blocks, and clay soil By John Dunbar



### Building and tools

#### 49 Tools and hardware for the backwoods home By James Ballou

A certain degree of self reliance is obtainable by those who have the knowledge and skills, resourcefulness, courage, common sense, and tools to perform most of the tasks necessary to their own survival and way of life.

### Country living

#### 22 Morels...a taste of springtime By Linda Gabris



## Publisher's Note

### The art of sensible preparedness

Magazines and industries that offer preparedness advice and products are sometimes accused of crying “wolf” when there is no wolf, or sounding the alarm when the only danger is in the form of their own dwindling customers.

This magazine has never been accused of such tactics in the 13 years of its existence, and for good reason. At the height of Y2K panic, when all the doomsayers and computer charlatans were lining their pockets by shouting “FIRE,” this magazine calmly predicted there would be no computer meltdown. It didn’t take genius to make that prediction—just honesty. All the facts were there for anybody who cared to take a look. But the false prophets of doom had center stage back then, and their loud voices drowned out fact and reason.

This is a new day, with a new perceived threat—the threat of terrorists coming to America with chemical and biological weapons, even with suitcase-sized nuclear bombs. Once again, the prophets of doom are emerging from their recent graves to give us hysterical warnings of imminent catastrophe.

Don’t listen to them. Don’t listen to their body counts in the event of a biological attack with x amount of anthrax. Don’t listen to their warnings that thousands of terrorists lurk among us just waiting to jump into their crop dusters to annihilate us with sarin gas. There is a need to be prepared for this new threat, but like all the threats of the past the preparations can be accomplished without resorting to the anxiety and panic solutions of the doomsayers.

Beginning with our last issue (Issue No. 73), we began examining this new terrorist threat by looking at chemical and biological terrorism, attempting to put it into perspective,

and making sense about what was possible or likely. We’ll continue that examination in this issue with a series of articles on nuclear terrorism, dual-purpose bomb shelters, and general preparation against catastrophes.

The explanations we give are based on facts, and the precautions we suggest are based on common sense and an examination of available technology. Being armed with accurate infor-

mation is vital in preparing yourself to face this new threat. And sensible preparation will give you a measure of peace of mind in the distant possibility that a terrorist threat becomes reality in your neighborhood.

America is still a very safe country. But there is a time to relax and there is a time to prepare. Now is one of those times when sensible preparations are in order. We think this issue will help you understand and begin to make those preparations.



**Dave Duffy**

### *Emergency Preparedness and Survival Guide*

If you haven’t bought our new book, *Emergency Preparedness & Survival Guide*, you’re missing out on a great deal. It’s a 100-page paperback that is a well written, concise overview of what you should do to prepare yourself against any potential disruption of society. We sell it for a modest \$12.95.

For an additional \$12.95, you can buy its companion CD-ROM, which contains all the information in the book, plus dozens of other articles comprising hundreds of pages.

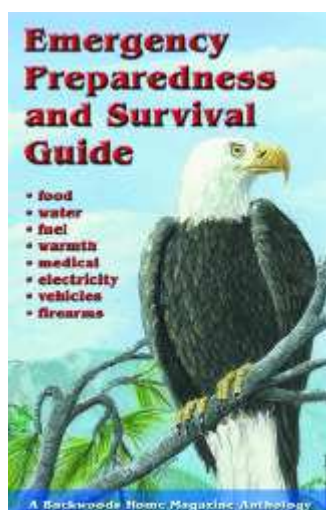
But the best deal of all is buying both the book and CD-ROM as a package for \$18. The ad on page 19 gives a little more detail about them.

### Happy birthday Alice!

One of the compliments I like hearing about this magazine is that our articles have the “ring of experience.” One of our main writers through the years, Alice Yeager, certainly fits that billing. She turned 80 between issues and has been writing about gardening for about half a century. Her husband, James, a spring chicken at 79, does all the beautiful color photography for her articles.

Alice is the oldest of our seasoned crop of writers. If I had to guess at an average age of our writers, I’d put it at about 59. What they all have in common is that they are gardeners, builders, and engineers first, and writers second. They are not *just* writers.

Happy birthday Alice! You and the others make us who we are. — Dave



# My view

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## Personal guns getting to be in style

Have you noticed how the mass media's attacks against gun ownership have gone way down since the terrorist attacks of September 11? Of course, it's kind of difficult to continue an unrelenting assault against gun ownership when half of your readers are going out and buying handguns to protect their families against terrorists.

Some in the media are even reporting incidents in which law abiding citizens have used personal firearms to defend themselves against criminals. In one recent robbery in Dorchester, a Boston neighborhood I lived in for three years, a liquor store clerk pulled out his own personal handgun after three robbers shot and stabbed two fellow clerks. The clerk, Kenneth Hoang, 31, shot all three robbers, who then fled only to be arrested a short while later while sitting in a pool of blood and stolen money.

What is amazing is that the story was actually *written up* in the *Boston Globe*, one of the more anti-gun newspapers in America's overwhelmingly anti-gun mass media. After ignoring the estimated 2½ million cases last year of private citizens using guns to stop crimes, the *Globe* finally reports one.

Wow! The September 11 attacks changed even more things than I thought.

Of course, the *Globe* did put some editorial comment into the story they wrote, calling the incident a "rare act of urban defiance" and quoting an anti-gun zealot: "I'm glad that it worked out in this particular case. But in the future we may be looking at a tragedy."

Tragedy? The tragedy is that it took the *Boston Globe* so long to take off its ideological blinders and finally report an incident that shows guns are so frequently put to good use. The tragedy is that the mass media across the nation has heretofore ignored the 2½ million annual cases of self-defense successes using personal firearms, but has laid in wait for the rare school shooting so they could plaster it all over their front pages for weeks.

Statistics compiled by law enforcement show the increased personal possession of firearms lowers violent crime in direct proportion to the amount of increase. Example: In the 33 states that now permit its residents to carry concealed handguns, the violent crime rate has dropped dramatically—up to 13% in the largest counties studied. Conversely, in England, where draconian laws banning handguns were passed in 1997, violent crime is up 40%. Disarmed Australia is having the same problems as England, while armed-to-the-teeth Israel and Switzerland are experiencing low violent crime rates.

Until recently, however, the mass media not only refused to report studies showing guns in a favorable light, but they

actively campaigned against gun ownership, using bogus statistics manufactured by outfits like Handgun Control, Inc. Now, since Sept. 11, they're not only reporting incidents of private citizens defending themselves with firearms, but a lot of reporters are going out themselves and buying handguns.

I never thought I'd see the day: personal guns for self-protection are getting to be in vogue. Gun stores can barely keep guns in stock. I'll bet gun-banning politicians like Dianne Feinstein are sure glad they already have their concealed carry permits. It's a long line to get one now, and gun instructors are reporting that their classes are all filled up well in advance.

You know what I think? I think the news media may have just had an epiphany. They saw the attacks of September 11 and realized the nation had just been mugged, and it's time to start defending ourselves. So they collectively threw their next batch of anti-gun stories in the wastebasket and decided to write some facts about an obvious method of self-defense for America, both collectively and personally.

Ironic, isn't it? We who have always championed guns for the "freedom protectors" they are, are now joined in combat by our archenemy—the antigun liberal, gun-grabbing mass media that has tried to disarm us for years.

Maybe I should have anticipated this. Maybe it's not so astonishing after all. Maybe it was more gradual than I think. Maybe the mass media was simply the last group of people in America to finally catch on.

After all, prior to 1987, almost no state had laws allowing private citizens to carry concealed handguns, but today 33 states have such laws. The number of people applying for those permits has been increasing steadily over the years, with applications during the past year alone increasing by more than 20%.

Overwhelmingly, courts have been ruling in favor of guns, tossing out the bogus state suits against gun manufacturers one after the other. The nation's new attorney general, John Ashcroft, who is the chief law enforcement officer in the nation, is an unabashed supporter of an individual's right to own firearms.

In spite of the past silence of the mass media, the public has been making its will apparent. Gun ownership is now at an all-time high in America, while violent crime is lower than it has been in more than 10 years. Handgun Control, Inc., now known as the Brady Campaign to Prevent Gun Violence—an oxymoron if I ever heard one—has laid off 20% of its staff due to a severe downturn in contributions.

What do the cops think of all this? More than 90% say individuals should be allowed to own a personal gun for sporting or self-defense purposes, and more than 60% favor a *national* concealed gun carry law.

Those statistics *were actually reported* in the *Boston Globe*! It is indeed a new day. — Dave Duffy



By Alice Brantley Yeager

Photos by James O. Yeager

**T**here is a sense of stability and survival if the household's food supply can be counted on under emergency conditions. Not so if the pantry has mostly empty shelves and the freezer is in about the same shape. From time to time, we hear the harbingers of doom state what can happen if produce or other food is contaminated by terrorists. We have no way of knowing what the international criminals are plotting, but now is not the time to drag our feet and become complacent. Instead, it is the time to begin preparing as much as possible to ensure that the food we preserve is as nutritious and free of contaminants as we can make it and that we put away plenty of it.

Those of us who are involved in gardening aren't too worried about the quality of produce coming from our gardens. We tend the plants from the time the seedlings appear until they mature and produce their crops. "Fresh from the garden," we take pride in saying and the excess we've put away canned, frozen, or dehydrated is a boost to our sense of well-being.

All emergencies don't necessarily result from catastrophes such as terrorist attacks. They can be produced by weather conditions—hurricanes, blizzards, tornadoes, and so on. We had one of those emergency situa-

**Top:** English peas are one of our spring delicacies and may be canned or frozen. The sooner they are cooked after picking, the better the flavor.

**Middle:** Home grown potatoes are a welcome addition to many meals. Those from our gardens have better flavor than those trucked hundreds of miles.

**Bottom:** Don't overlook what Nature produces in the wild. The native pecan is a favorite and grows mainly along river valleys in the central part of the United States.





*Even though tomatoes may not be in perfect shape, when they are turned into soup, who knows?*

tions in our southwest Arkansas area in 2000. It began on December 25 in the form of an ice storm, the likes of which had never before been recorded for this area. By nightfall, residents and businesses alike had lost electrical power. Folks with all-electric homes were really in a bad situation.

Fortunately, we have never put all of our eggs in one basket. We have a natural gas kitchen range and water heater and we have a real wood burning fireplace in our den. Nevertheless, due to the failure of our central heat system, our house could not be kept comfortably warm and it was downright cold in some rooms. Our electricity was off for 10 days and some folks had no power for 2 weeks or more. Our kerosene burning antique lamps from the good old days were pressed into service and we were thankful for a radio that could operate on batteries.

Trees that had endured all kinds of weather over the years were battered by the ice storm. Christmas night was like living with the sounds of a war

zone. Huge limbs and tops of trees snapped with gunshot sounds and came down with enormous force burying whatever grew beneath and near them. Tree farms were almost totaled. Orchards suffered likewise. Our garden area was ringed with the remains of what had once been shade trees. If the garden had not been in an open area, it would have taken weeks to clear it of debris. As it was, we only had to remove a few limbs and prune broken branches from some fruit trees. What a mess!

Our home canned and dehydrated items came through all right in the pantry, but the contents of our freezer thawed out and had to be discarded. Ordinarily, we could have taken all of this in stride, but I was on a walker due to a strained leg muscle forcing



*Surplus crops of beans, peppers, and tomatoes may be made into delicious vegetable soup.*



*The okra plant not only produces edible pods, but it produces lovely yellow flowers to brighten the garden.*

James to fall heir to all outside chores including bringing in wood for the fireplace. After things began to return to normal, James had a bout with pneumonia. The 2000-2001 holiday season was not one of our best. To add to the area's troubles, New Year's Day was ushered in with several inches of snow. This doesn't sound like much to northerners, but the camellia and magnolia adorned South is never ready for snow and ice.

I mention this trying experience to emphasize that disasters come in many forms and that we all need to be prepared when they happen. Most of all, we need to learn from them. One lesson we learned from the ice storm involved buying a generator, one that will produce enough power to keep essential appliances operating. We may never need the generator, but, if we do, at least we won't lose a freezer full of nourishing home-grown food plus the items in our refrigerator.

Praise be that winter doesn't last forever and spring always follows. Spring may not be perfect, but it's better than trying to deal with wintry





*Small ornamental pumpkins heighten autumn table decorations, but the larger pumpkins can be made into several pints of canned pumpkin for pies, cakes, etc.*

conditions. The first sprigs of new grass and even chickweed are welcome as they tell us it's time to get out our hoes, rakes, and trowels and go about the business of freshening our food supply.

A few years ago, we converted our row type garden to raised beds and we have found that we now have a tendency to coordinate plants better, thus making the most of the space under cultivation. It's easier to control watering when necessary and compost stays where we put it. Unless one is trying to harvest enough produce to sustain a large number of people, raised beds are the way to go. A surprising amount of vegetables may be gathered from raised beds and it's easy to take out depleted early plants such as lettuce or spinach and replace them with summer crops. In turn, summer crops may be replaced with a variety of greens and plants that thrive under cool fall weather.

Folks who take heed for the future always begin gardening early, and

one of the first things planted in our Zone 8 is Irish potatoes. Oldtimers swear by the planting date of February 14, but it's hard to plant right on the 14th if the weather isn't cooperating. At any rate, by the time you dig your crop of potatoes, you should be able to use the space for a summer grower such as bush beans.

Potatoes come in quite a variety of choices now, some large like Red Pontiac or Kennebec and others of the mini or gourmet type. If you aren't familiar with growing potatoes, it might be well to check with your local County Extension Agent or a neighbor gardener to determine which varieties do best in your area and when to plant them. Like other plants, potatoes are subject to certain viruses, etc., and it's best to find out about diseases beforehand.

Whether you buy your potato pieces locally or from a seed company, you should get certified seed potatoes. If you buy whole potatoes, cut them into pieces containing not over three

### Suggestions

1. Obtain a field guide, particularly one that gives information about wild plants growing in your area and how to forage for them. Many food plants are found on railroad dumps, in fields, and other cleared places. Some require a little more shade such as along the edge of wooded areas.

2. Buy a book on canning, freezing, and dehydrating food items. Buy one that is published by a manufacturer of canning supplies. Addresses may be found on cartons of canning supplies.

3. Unless you live in a dry climate such as New Mexico or Arizona where outside drying of fruits and vegetables is feasible, you will find an electric dehydrator very handy. It maintains a constant temperature, thus eliminating worry over humidity.

4. Anticipate what can happen to your food supply, particularly if in a freezer, when electrical power fails. Be ready with a backup system—a generator able to generate enough power to keep your essential appliances in operation.

5. Thieves seem to be on the increase. Don't place your freezer on your back porch in plain view or inside an unlocked area. Put it in your kitchen, utility room or somewhere not easily seen by prying eyes. Your freezer may be worth its weight in gold in case of a food emergency.

eyes. Do this a day or so before planting so that the cut surfaces will dry somewhat and be more disease resistant. To further immune them, dust the pieces with sulphur. Don't plant potatoes you have bought at the supermarket. They are not seed potatoes and your yield will be disappointing.

In our raised beds, we plant the potato eyes firmly about a foot apart on top of loose, loamy soil and cover them with about 4-5 inches of organic



mulch. As the sprouts push through the mulch, more is added to keep tubers from being exposed to the sun and developing green spots. This method produces a nice clean potato and the potatoes are easy to dig.

If you're planting in the regular way, you'll need to dig trenches about 6 inches wide and 8 inches deep in loose soil making trenches about 30 inches apart. Commercial fertilizer recommended is 5-10-10 which should be spread in the bottom of the trenches at a rate of about a pound to 25 feet. You never want potato pieces to come in direct contact with the fertilizer, so place at least 2 inches of soil over the fertilizer. Plant the potato pieces, eyes up, 12-15 inches apart and cover with about 4 inches of soil. After the first leaves emerge, start hilling up soil against the plants. As they grow, hill them with compost. Be sure that plants receive adequate water if dry spells occur.

Potatoes should be dug as soon as vines die down and the new potatoes spread out in a shady ventilated place. Any clinging dirt may be whisked off with a soft brush when dry. Potatoes will keep for several weeks stored in a cool place and even longer if refrigerated. If you haven't tasted cooked, freshly dug potatoes, you're in for a pleasant surprise. Treat your family to a good pot of potato soup. It'll go a long way toward satisfying hearty appetites. (See recipe.)

English peas grow well in early spring weather and the peas are excellent for freezing or canning. These peas may be planted when ground temperature is 45°-50°F., but if warm weather arrives early, yield will not be as heavy as vines tend to succumb to heat. You will see more English peas in northern gardens than in the South. We have had good luck with Dwarf Grey Sugar due to its heat tolerance. If we have a late spring, the pole type, Tall Telephone or Alderman, will produce well here.

Both have good flavor and the Dwarf Grey is also an edible pod pea.

Peas prefer moderately rich, loose soil with pH 6.0-8.0. Plant them according to packet directions, as some varieties require a little more room than others. The vines need support—sturdy wire trellises, brush cuttings, etc. Most varieties don't grow over 3 feet high, but the Tall Telephone grows to a height of 5 feet or more thus needing a taller support.

Peas are like ears of corn in that the sooner you can cook them the better, as they start to lose flavor and quality as soon as picked. It takes a backyard garden to do justice to the English pea. Can or freeze your excess peas as soon as possible after harvesting.

Many greens including mustard, spinach, turnip greens, and Pak Choi may be canned or frozen. All of these are easy to grow and yield best when planted in early spring. They all require the same type soil and growing conditions and are certainly worth considering if you like greens. Some gardeners prefer broadcasting the seeds and others like to plant in rows. We prefer rows, as it's easier to apply an organic mulch to keep dirt from splashing onto leaves during spring rains. No one likes to deal with gritty greens.

There are numerous other early yielding crops that may be enjoyed from the garden—radishes, carrots, beets, onions, cabbage, and so on. Avail yourself of some catalogs from established seed companies, compare prices and order seeds or plants to suit your taste and space. Blessings on those companies that send their catalogs to be perused during long winter months.

Summer probably gives us more produce from the garden to preserve than any other season. That's when it seems we have an overflow of everything—corn, beans, peppers, tomatoes, squash, you name it. Summer also gives us long days with plenty of sunshine. The plants need the long,

warm days to mature their crops and we need the long days to harvest and put away our excess.

Sometimes we tire of putting up each kind of vegetable individually. That's when imagination can give us some dandy ideas. For instance, how about merging tomatoes, green beans, carrots, and such into vegetable soup to tuck away in the freezer. (See recipe.) Frozen cartons of vegetable soup are very handy to have whether or not there's an emergency situation. Just put a carton in a double boiler to heat and serve with crackers or hot cornbread.

Besides your own garden, there are other places to find food plants to process. If you like strawberry preserves and you don't have space for strawberry plants in your garden, try seeking out wild strawberries. You'll find them growing in patches in fields mainly in the cooler parts of states east of the Mississippi River. We tried for several years to grow plants we had brought from Ohio and, although the plants thrived and multiplied, they were never very productive. We concluded our climate was a little too warm and humid for wild strawberries.

There are other berries, too—dewberries, blackberries, raspberries, and so on to harvest from the wild. Or, if you have space, you may want to purchase tame varieties from nurseries to plant along the edges of your garden. Wild berries have better flavor than the tame ones, but they may all be made into jellies and jams or the juice extracted, frozen, and used at a later date. Berries may be canned or frozen whole for cobblers, pies, cakes, etc.

Depending on the region in which you live, don't overlook the possibilities presented by wild plums, muscadines, persimmons, mulberries, May haws, crab apples—an endless list. There are also nut trees—hickory, pecan, beech, chinquapin, black walnut—another long list.

Growing in the wild are many vegetables—poke salad, dandelion, asparagus, wild onions, Jerusalem artichokes, mustard, wild rice, and on and on. Many of these are best enjoyed fresh, but a number may be preserved. They are a tasty source of food, full of nutrition and will certainly provide variety to meals.

Foods from the wild may be harvested yearlong beginning with early greens to nuts maturing in the fall. It's a pity that we lean heavily on what we can raise in our gardens and turn down what Nature offers us just for the taking. Pioneering people were proficient in foraging for what the land had to offer even though many of them did have gardens. We newcomers need to learn more about nature's bounty and how to use it.

During this day and uncertain time, it is foolish not to be prepared for emergencies. Even primitive people put away food to sustain them during tough winters and other trying times. We have come a long way from their methods, but we still have one thing in common with them—we still depend on food to keep us going.

We live in a land of plenty. Let's make the most of it and in so doing be prepared for the unexpected.

Some reliable seed companies:

**Pinetree Garden Seeds**

Box 300

New Gloucester, ME 04260

**W. Atlee Burpee & Co.**

Warminster, PA 18974

**J. W. Jung Seed Co.**

335 S. High Street

Randolph, WI 53957-0001

**Totally Tomatoes**

P.O. Box 1626

Augusta, GA 30903

**Geo. W. Park Seed Co.**

1 Parkton Avenue

Greenwood, SC 29647-0001

**Want more**

**Yeager?**

**[www.backwoodshome.com](http://www.backwoodshome.com)**

**Potato soup**

4 cups peeled, diced Irish (white) potatoes  
1 medium onion, coarsely chopped  
3 tablespoons flour  
1 tablespoon butter or oleo  
1 quart whole milk  
1 egg, beaten  
salt and pepper to taste

Boil potatoes and onion in just enough water to cover. When tender, add milk, salt, and pepper and reheat.

In small skillet, brown flour in butter and slowly blend into potato mixture. Add a bit of water to beaten egg and slowly stir into soup. Let simmer a few minutes to thicken. Stir often to keep from sticking. (I like to transfer this soup to a double boiler when it begins to simmer, as there's less danger of sticking.)

Garnish bowls of soup with chopped green onions, parsley, or grated carrots to add a touch of color.

This is a versatile basic recipe. Any number of things may be added to change it. Try adding tuna that has been drained and flaked. Another idea is to add crumbled cooked bacon.

**Succotash**

Going 'way back—back to the time when Native Americans befriended the first white settlers, there was a dish called succotash. This was one of the foods served by Indians to the settlers. (No microwave ovens or kitchen ranges in those days.)

Succotash is never as tasty or nutritious as when made from fresh corn and beans. Canned ingredients never do it justice. This is the basic recipe. Some versions add chopped onion, bits of crumbled, cooked bacon and so on.

3-5 large ears fresh corn (2 cups when cut from cob)  
2 cups fresh butter beans (limas)  
5 tablespoons butter  
salt and pepper to taste

Boil corn in water about 7-10 minutes until corn is just tender. Remove ears from water and cut off kernels as close to cobs as possible. (The cobs lend flavor, so you may want to boil them with the corn and beans and discard cobs before serving.)

Cook beans in just enough water to cover. (Should require about 20 minutes.) Combine corn and beans, butter, and seasoning and reheat. Serve hot.

This dish is not recommended for preserving as it loses flavor in the process. It's mainly to enjoy when there's a surplus of corn or lima beans from the garden.

**Vegetable soup**

This is a basic recipe. Many substitutions may be made, such as adding lima beans, corn, squash, rice, etc., and leaving out sweet peppers or okra. Dried basil and garlic powder may be used instead of the fresh items. Be sure all vegetables are cleaned and any blemishes removed.

1 quart green beans, snapped  
1 quart tomatoes, peeled and chopped  
2 cups sweet peppers, coarsely chopped  
2 cups onions, chopped  
2 cups carrots, chopped  
2 cups okra, sliced in 1/4-inch rounds  
1 cup sweet basil, chopped  
1 large clove garlic, minced  
1 Jalapeno pepper, finely chopped  
1 quart beef or chicken stock  
1 quart chopped, cooked beef or chicken meat  
6 ounces broken spaghetti, elbow macaroni, or your favorite type pasta  
salt to taste

Put all vegetables and meat in a large pot and cover them with water. Add meat stock, cover pot, and bring to a boil. Add pasta and reduce heat to simmer. Cook until vegetables are tender—about 20-30 minutes. Stir


occasionally. If soup seems too thick due to absorption of water by pasta, add a bit more water until you have your desired consistency.

You may prefer to season this soup with butter. I like to season with beef or chicken stock. I do not buy the highest priced beef or chicken. Instead I buy meaty beef soup bones or neck bones, pressure cook them (may be boiled, but takes longer), and remove the meat to use in soup. (Some four-footed friends are happy to get the bones.) Any surplus beef stock is put in airtight cartons and frozen for later use.


Chicken leg quarters pressured or boiled will yield good chicken stock. Surplus stock may also be frozen. (I don't give the chicken bones to the dogs.)

Have a hearty meal from your soup and put the rest in the freezer. Be sure to leave room at the tops of cartons for expansion. Don't forget to date and label cartons which should keep well for at least a year. Δ

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**A**re you prepared for a disaster that could affect the daily function of your life or the lives of your family members? Or do you even believe a disaster will ever affect you?

But not only do they happen, they can happen to you. And when they do, you will be on your own. The tragedy of September 11 illustrates this well. Look at the total disruption of transportation and emergency services in New York City immediately following the terrorist attack. This was followed by the immediate and complete paralysis of air transportation throughout the United States. Thousands were stranded for days on their own in strange cities.

As serious as these attacks were, they pale in comparison to the possibilities. Consider a major biological or nuclear attack or accident. Hundreds of thousands of casualties are predicted in some scenarios. Even the major earthquake predicted for the Midwest is expected to cause widespread destruction and casualties.

These disasters or attacks would overwhelm local, regional, and national emergency resources and cause widespread panic. Transportation would stop, markets would be stripped of food within hours, essential emergency services would be overwhelmed, and food, medical supplies, and emergency service workers would be sent to the

## Are you prepared?

Some of us need to be prepared for being at “ground zero.” Certain areas are the most likely direct targets of terrorists or natural disasters. All of us need to be prepared to be indirect targets, those affected by the temporary collapse of our nation’s infrastructure.

In short, we all need to be able to live self-sufficiently for a period of time.

What to prepare for will depend on your geographical area. Natural disasters and the risk of major terrorist attacks vary by where you live. The first thing you need to do is make a list of the possible disasters for which you need to prepare. Some of the things you will want to consider include natural disasters, such as blizzards, floods, earthquakes, hurricanes, and wild fires, as well as technological disasters, such as nuclear, biological, chemical (NBC) attacks, and hazardous material accidents.

Don't forget cyber-attacks, the possibility that an enemy could attack our computer systems, shutting down electrical, gas, communications, transportation, and emergency and medical services. What about attacks



*FEMA recommends you have a portable disaster supply kit that contains all of the food, water, and emergency supplies that your family would need for three days.*

disaster area, leaving critical shortages in local areas. After Hurricane Andrew devastated Florida, plywood was in short supply throughout the country as it was being sent to rebuild the state.

Many do not prepare for these emergencies. During one earthquake in southern

on our farms and agricultural processing plants? While they would likely affect only a small number of people directly, they would completely shut down food production and distribution systems.

While there are many things to plan for, your response to all of them is one of two things: **stay at home** or **evacuate**. For blizzards, earthquakes, cyber-attacks, nuclear fallout, quarantine after biological attacks, and collapse of the infrastructure, you will want to stay at home. For floods, hurricanes, or with some advance notice of NBC attacks, evacuation may be your course of action.

Whenever possible, staying at home in your own environment and with your own emergency supplies is the best choice. When you evacuate, you are essentially a refugee at the mercy of government evacuation centers or the compassion of the local population. In a major disaster, don't expect to be welcomed by the locals who are struggling with their own survival.

In all situations, you will need to be able to think for yourself. Confusion always accompanies a major disaster and initial information and instructions may be conflicting and incorrect. Some caught in the World Trade Center were initially advised that everything was fine and they should stay at their desks. Those who took matters into their own hands immediately evacuated the building. So, monitor the radio and television for official instructions on what to do, such as whether to evacuate or not, but don't assume they are correct. Make your own decisions based on your plans and preparation.

## Riding it out at home

Key to your survival is preparing a disaster supplies kit, essentially the stockpiling of all materials that you would need to live on if you are cut off from outside utilities, water, and supplies. Once a disaster occurs,

there won't be time and materials may not be available.

How long you will need to be self-sufficient is hard to say. The Federal Emergency Management Agency



*Full face respirators can be part of your preparation if you live in an area where hazardous materials spills or chemical attacks are possible.*

(FEMA) advises everyone to store enough food, water, and supplies to take care of their family for three days. Preparing a "72-hour kit" is a good idea. It can be used for immediate evacuation and part of your overall disaster supply kit. Place items in a portable, easy-to-carry container, such as a large plastic box or duffel bag, ready to grab at a moment's notice.

But, is it enough? A blizzard, earthquake, quarantine, or nuclear fallout could confine you for much longer. You need to be able to take care of all the needs for your family for a period of at least two weeks and possibly longer. Having supplies for one to three months is not all that unreasonable or hard to accomplish.

There are six basics that should be part of your home disaster supplies kit: water, food, first aid supplies, tools and emergency supplies, clothing and bedding, and special needs items.

**Water.** An individual must drink at least two quarts of water per day to

avoid dehydration, and as much as four to five in hot weather or if they are exercising or working hard. Store at least a gallon of water per person per day (two quarts for drinking and two for food preparation and sanitation) in food-grade plastic containers, such as water containers or empty two-liter soda bottles. Thirty to fifty-gallon containers are also available and can be stored in a garage or shed. Rotate water supplies every six months so they stay fresh.

For extended disasters, additional water may need to be obtained. Rain is pure water and can be used without further purification. Water from lakes, streams, or reservoirs should be purified by boiling, using a portable water filter, or by adding a water purification chemical, such as *Polar Pure* or *Potable Aqua*.

**Food.** Non-perishable foods that require no refrigeration or cooking and which use little or no water to prepare are the best for your disaster kit. Ready-to-eat canned foods including meats, stews, beans, fruits, and vegetables are the mainstay of the food supply, along with canned juices, milk, and soups. Include high energy foods, such as peanut butter, crackers, granola bars, energy bars, or trail mix and some comfort foods, such as cookies, hard candy, coffee, or tea.

For foods that must be cooked, be sure to have a camping-type cook stove and fuel, Dutch oven and briquettes, or other cooking source. This will allow you to prepare more types of food, such as rice, dehydrated foods, flour biscuits, and cornbread.

Consider shelf life of stored foods. Rotate regular canned goods and food every six months. Eat the stored food as part of your regular meals, replacing it with newly purchased food. (Read *Backwoods Home Magazine's Emergency Preparedness and Survival Guide* advertised on page 19 of this issue.)

Numerous companies sell emergency foods that are packaged to last for 5 to 10 years and are good to have around since you don't have to worry about rotating food as often. Military MREs (Meals Ready To Eat) are also available and have a long shelf-life, although they are bulky and expensive. They are convenient to have in your vehicle disaster kit, however.

**First aid supplies.** First aid kits should be available in your house and vehicles. Your local American Red Cross chapter can supply you with a basic first aid manual and list of first aid supplies. Your home kit should include items to treat injuries such as lacerations, sprains, and burns, as well as medicines, such as aspirin or non-aspirin pain relievers, anti-diarrhea medicine, laxatives, and antacids.

**Tools and emergency supplies.** Tools and emergency supplies should include such things as battery-operated radio and flashlights with extra batteries, cups/plates/utensils, non-electric can opener, matches, lantern, fire extinguisher, hand tools for repairs and to turn off household water and gas, a whistle, and plastic sheeting. For sanitation, include toilet paper, towelettes, soap, toothpaste, personal hygiene items, disinfectant, and household chlorine bleach. Many more items can be added. Think through the things you use on a daily basis.

**Clothing and bedding.** Clothing and bedding would include a change of clothing and footwear for everyone in the household, rain gear, cold weather clothes, hat and gloves, and blankets or sleeping bags. Remember, a house or car can get very cold without heat. Prepare for the worst weather that you might encounter.

**Special needs items.** Special needs items may include formula and diapers for infants, prescription medications, contact lenses and supplies, extra glasses, and other supplies or equipment for infant, elderly, or dis-

abled individuals. Ample pet food should also be stored. Confinement in the house during a disaster can be boring, especially for children, so remember books, games, and other entertainment.

*There are six basics that should be part of your home disaster supplies kit: water, food, first aid supplies, tools and emergency supplies, clothing and bedding, and special needs items.*

Store your disaster supply kit in a convenient place that is known to all family members and make sure they know your family's disaster plan. Evaluate your kit once a year and update it according to family needs.

## Evacuation

You may not have much time to prepare when you need to evacuate. A hazardous materials spill could mean instant evacuation, so always have a smaller version of your home disaster supply kit in the trunk of your car.

When you have advance warning of an evacuation, bring your portable "72-hour" disaster supply kit, along with additional food, water, and clothing. Keep important family documents in a waterproof, portable container, ready to bring with you in an evacuation. These may include your will, insurance policies, contracts, deeds, stocks and bonds, passports, social security card, bank and credit account numbers, family docu-

ments (birth, marriage, and death certificates), inventory of valuable household items, and important telephone numbers. It would be a good idea to always keep some cash in this container, so you have it for an emergency. If there is time, valuable family heirlooms or photographs can be added.

Keeping a checklist of what to bring in an evacuation is a good idea. In the stress of the moment, it is easy to forget an important item.

Now that you have a basic plan for any emergency, let's consider plans for some specific risks.

## Nuclear attack/accident

A nuclear disaster could result from an accident at a nuclear power plant, a detonation of a nuclear device by terrorists or a rogue nation, or an explosion of a "dirty" bomb, an explosive surrounded by radioactive material. Individuals at "ground zero" will have little chance of survival. The risk for others is the exposure to radiation.

Radiation is dangerous because of harmful effects on the body. In large amounts, radiation can cause radiation sickness, thyroid and other cancers, and death. These effects are



*Foods that have a shelf-life of 5 to 10 years are available from many disaster supply companies and are a good way to be sure that your food does not spoil.*



greater the longer a person is exposed to the radiation and the closer the person is to the source. If radiation is released into the atmosphere, it can travel for thousands of miles, contaminating the ground and living organisms as it settles back to earth on dust or rain. This is called fallout radiation.

Time, distance, and shielding are the factors that minimize exposure to nuclear radiation. Most radiation loses its strength fairly rapidly, but it is important to limit the amount of time spent near the radiation source. The farther away an individual is from the radiation source, the less exposure. Shielding is a barrier between an individual and the radiation. Concrete, earth, and structures are good shields. Depending on the distance from the source, the best protection from radiation fallout may be to remain indoors.

After a nuclear disaster you may be advised to evacuate. If so, remain calm, pack your evacuation survival kit in your vehicle, and follow the evacuation routes out of the area. If there is time before leaving, close and lock windows of your house, close fireplace dampers, turn off air conditioning, vents, fans, and furnace. Doing these things will make your house safer when you return by minimizing exposure to the inside of your house to fallout.

If you are advised to remain at home, bring pets inside, secure your house from fallout by closing and locking doors and windows, closing fireplace dampers, turning off air conditioning, vents, fan, and the furnace. If your emergency supplies are stored in a garage or barn, bring them inside and, if there is time, store additional water in tubs, sinks, and available containers. Inside the house, the safest area is a basement or underground area, followed by an interior room with no windows. Stay inside until authorities say it is safe to go outside.

When coming in from the outdoors after exposure to fallout, shower and change clothes and shoes. Put the contaminated items that were worn outside in a plastic bag and seal it. Open water sources (streams, creeks, lakes), fruits and vegetables from outdoor gardens, and livestock will all be contaminated. Do not eat or drink products from these until you know it is safe.

(Also read Jeff Yago's article in this issue about building an underground shelter, and John Silveira's article on terrorists and nuclear devices.)

## Bioterrorism

Very few people were actually infected in the anthrax attacks because it took direct physical contact with the bacteria to develop the disease. Other biological agents are contagious (passed from person to person), however, and are much more dangerous.

Biological agents are microorganisms (bacteria or viruses) or toxins that produce diseases in humans. The Center For Disease Control (CDC) lists 17 biological agents that may be used as weapons, including anthrax, smallpox, plague, and botulism. They are not immediately detectable, may take days to grow and spread, and it is impossible to know when an attack occurs. While preparations are being made for defense against such attacks, nobody really knows what to expect. Fortunately, most of these biological agents are hard to make into weapons. Worst-case scenarios, such as suicide terrorists infected with smallpox traveling through metropolitan areas, are staggering, however. Thousands of victims would overwhelm medical services and die.

Likely? Hopefully not, but who knows? Those at "ground zero" who are infected will need professional medical help. With air travel, people will spread the disease all over the country before we even know an attack occurred. The rest of the coun-

try will shut down as soon as authorities realize what happened.

Expect widespread closure of the country and mandatory quarantines. Transportation, food, and vital services will stop. Plan to stay at home if advised or ordered and avoid exposure with outsiders who may carry disease. Your stockpile of food and supplies should get you through this disaster. You may want to have some medical-type masks and gloves on hand.

Should you stockpile antibiotics in preparation for such attacks? Authorities say no and this may be practical advice. A large number of different types and amounts of antibiotics would need to be stored to protect your family against all likely biological weapons. Many of the diseases are viruses, not treatable with antibiotics, and those treatable by antibiotics might be altered to make them resistant to available antibiotics. Besides, you will need professional medical care if you are exposed.

## Chemical terrorism and hazardous spills

Chemical agents are gases, liquids, or solids that are poisonous to humans. Depending on the type and amount of the material, exposure to chemical agents can cause illness or be fatal. Chemical agents include chlorine or ammonia gases that are transported on trains daily, other hazardous industrial chemicals, and chemical warfare agents, such as nerve agents, blister agents, blood poisons, and others. The CDC lists 58 known chemical warfare agents.

Some nerve agents, such as Sarin, used in the attack in Japan, kill quickly. If you are at "ground zero" in such situations your only chance is to evacuate immediately.

A hazardous materials spill is probably more likely than a terrorist chemical attack. For gases and other chemicals that spread in the air, evacuation to avoid exposure is critical.

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Leave the area as soon as you are aware of the incident. Full face respirators (gas masks) may be useful for escape in such situations. Buy good quality, new masks designed for industrial or rescue use, not army surplus masks. New respirators cost about \$80 and are not a bad idea to have, especially if you live in the vicinity of train tracks where derailment of cars containing chorine or ammonia is a possibility.

## Natural disasters

Natural disasters are somewhat easier to prepare for—you either get out of their way (evacuate) or you protect yourself indoors.

**Floods.** Sandbag doors and windows, move furniture and other items to higher ground, and evacuate if necessary. Do not drive or walk through flood waters and stay off bridges when they are covered with water.

**Hurricanes.** Preparation should include boarding up windows and flood-proofing your home. Bring in outside furniture, bicycles, and garbage cans. Listen to recommendations of emergency officials and evacuate if advised. If not advised to evacuate, stay indoors and away from windows.

**Blizzards.** Stay indoors and use the telephone only for life-threatening emergencies. Use fires safely and properly ventilate. If there is no heat, cover windows, close off un-needed rooms, and stuff towels in cracks under doors. Wear layers of warm clothing. Eat and drink plenty. Food generates body heat and water helps circulation to keep the skin warm.

**Earthquakes.** If you are indoors, stay there and take cover under a heavy table or desk while keeping away from windows. Do not use elevators. If you are outdoors, stay outdoors and watch for falling debris, trees, or power lines. After the earthquake, check for injuries or fires, check for damage including gas, water, and electrical lines. If you

smell gas or there is a fire, turn off the gas at the main gas valve and switch off the main circuit breaker. Do not enter damaged buildings.

## Be prepared

It is important to know what to do and have a plan before a disaster strikes. The American Red Cross and FEMA can provide additional information for preparing for and dealing with natural disasters and terrorist attacks. Consider your risks, develop a plan, prepare your disaster supplies kit, and discuss with your family what to do in case of an emergency.

Remember, the future belongs to those who prepare. You must be ready *before* disaster strikes.

## Sources

Two of the best sources of information to help you prepare are the *Backwoods Home Magazine Emergency Preparedness and Survival Guide* and their *Years 7-10 CD-ROM*, both of which are advertised on the next page. The *Emergency Preparedness and Survival Guide* is a quick, concise paperback read—100 pages (its companion CD-ROM has several hundred pages). The *Years 7-10 CD-ROM* is a big in-depth read—1497 pages. Δ

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# Morels ... A taste of springtime

By Linda Gabris

One of the finest treats springtime meadows and woodlands have to offer foragers are marvelous mushrooms belonging to the *morchella* family. These delectable, highly praised mushrooms are more commonly known as morels.

Morels are an ideal mushroom for novice pickers as they are easy to identify, grow in fair abundance in most wooded areas across the country, and all members of the genus are edible. For experienced mushroom addicts such as myself, morels are a number one favorite.

They start to dot grassy grounds and open wooded areas round the end of March. Their prime growing season is



April, but I have hunted them right into the last days of May and during wetter springs, on into early June. Although some members can be found sprouting under conifers, the preferred habitat of morels is in the leaf rot under deciduous trees. They seem to grow best on damp, fertile soil with some filtered sun. One of my favorite places to search is along the banks of rivers and streams where the earth is moist. I have also discovered some very bountiful patches of morels growing in treed pastures that are rich in manure.

Morels come in various sizes and shapes with spongelike caps that can be rounded or conical in shape. The caps range in color from pale buttery

yellow to grey, tan, or very dark brown. They grow on hollow firm stalks, usually white or creamy in color, with some species reaching heights of four or five inches tall. Others have very short stalks with caps growing close to the ground. Some caps are hemmed to the stalk, while others are unattached like umbrellas.

Because of the variation in size, shape, and color of morels, they are difficult to identify by species, but since they are all edible this shouldn't cause much concern when collecting them for the table. Sometimes the size and shape of the mushroom reflects the particular growing season. Rainy springs often produce tall, plump juicy mushrooms while drier seasons yield shorter, narrow, less meaty ones.

It is surprising to note that in some areas a picker will have to comb the woodlands for miles in order to find a few handfuls for dinner. Yet, on other grounds one can discover patches so plentiful that a six-quart basket can be filled while sitting on a log enjoying the warmth of spring sunshine. In these priceless patches one can get enough mushrooms for several fresh feeds as well as some to dry and put away for winter use.

After an exhilarating pick, bring the morels home and rinse under cold running water. Pat dry on paper towels. Slice in half and sauté in butter until the liquid is reduced to a few spoonfuls. Add some minced garlic, if you care to. Sprinkle with a shake of flour and let thicken. Season with salt and pepper and mound on slabs of crispy toast. I like mine topped with a dab of Tabasco. Once you've sampled this delicious snack, you'll be eager for the next hunt. To make this dish into a full meal, you can serve it with a couple of poached eggs perched on top of the mushrooms. Simply fried in butter, morels make an excellent topping for

steak or pork chops. They turn an ordinary dish into a gourmet creation.

When the picking is good and you find yourself with more mushrooms than you can eat up fresh, then you might want to dry some to dress up winter meals. To dry morels, just thread a needle with some strong thread—a darning needle threaded with fishing line works well—and string up the mushrooms. I leave mine whole, but to cut down on drying time you can halve the mushrooms. Hang in an attic or a dry place until completely dried. For large batches you can spread on screens. Once dry, store in a paper bag and use just as you would any store bought dried mushroom. Crumple a few into soups, stews, and sauces for a really great burst of spring flavor. Δ

**Important note: If you are ever uncertain about the identity of a mushroom that you intend to eat, play it safe and check first with an experienced picker.**



*Linda Gabris with baskets full of morel mushrooms.*



### Vegetarian love

Do you carrot all for me?  
My heart is soft as squash.

For you are such a peach,  
With your radish hair and turnip nose.

You're the apple of my eye.

If we cantaloup, lettuce marry anyhow,  
For I know we'd make a pear.

Grandma Ruth's version of an old poem

(Submitted by Dorothy Ainsworth)



### Remembering the Morel King

One bright April Sunday afternoon  
we caught green sunfish in Leck's pond until  
the fish refused to bite and our bucket  
swirled full. Then we wandered tangled brush behind  
the dam and found a dozen morels. He  
called us to the first, a tiny tepee  
beneath an elm so we would know, could see  
what we searched for. Such distant memories:  
sleek, green-blue fish, a few handfuls of a kind  
of fungus, blue racers following the truck;  
the strange, shivery parting in the grass still  
tingles when I think of it—I wore no shoes.  
Now my dad and children all are gone  
so I do my spring mushroom hunt alone.

Jim Thomas  
Hermann, MO

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## the *gee-whiz!* page

By O.E. MacDougal

**A predatory advantage.** Fish are cold blooded (endothermic) because they have no means of generating heat in the way warm blooded (exothermic) mammals and birds do. However, as a fish swims about, its muscles perform work and one of the by-products of this work is heat. But the heat doesn't accumulate in its body because it is picked up by the blood as the blood returns to the heart. And before it gets to the heart, the blood passes through the gills where the waste product, carbon dioxide, is exchanged for fresh oxygen which is extracted from the water. At the same time the warmed blood is cooled by the surrounding seawater. As a result its body temperature is rarely any higher than the water the fish swims in.

However, in certain types of fish, which include tuna and mackerel sharks, venous blood returning to the heart passes through a web of blood vessels called the *rete*

*mirable* (which roughly translates as "miraculous network") before it reaches the gills. Also passing through this unique organ, but going the other way, are the arteries, now rich in oxygen, that are coming from the heart. The *rete mirable* acts as a heat exchanger as the heat from the blood in the veins warms the blood in the arteries. As a result, much of the heat generated by the working muscles stays in the body raising the fish's body temperature.

If the fish is in warm water, this results in a body temperature only a few degrees warmer than the sea. But in cold water the fish's body temperature can be as much as 20°F warmer than the water the fish is swimming in. This confers an enormous advantage on these fish, all of which are predatory, because warm muscle tissue reacts quicker than cold muscle tissue and allows tuna and other fish with a *rete mirable* to swim much faster than their prey.

**The weight of gold.** You walk into a room where three cubes, each made from solid gold, are resting on a table. One of the cubes is 4 inches on each side, the second is 8 inches on each side, the third is 12 inches on each side. Before approaching the table you are stopped and told to choose any one and, if and only if you can lift it and carry it out of the room, it's yours. But if you can't carry out the one you choose, you must leave them all. Which would you select?

Unless you're a weight lifter, you'd better choose the smallest block. It weighs 44½ pounds. And even if you are a weight lifter, the 8-inch block weighs about 356 pounds. But the 12-inch block would be too heavy for any human to lift. It weighs 0.6 tons.

But don't feel bad for taking the smallest one. At this writing gold is going for about \$279 per troy ounce and, after doing the conversion from avoirdupois pounds to troy ounces, your 4-inch cube would be worth about \$181,000.

Which brings up the question, what is avoirdupois weight? It is what used to be called the common English measure in which an ounce is 437½ grains. It is still the weight measure used in the United States. However, troy ounces, sometimes called jeweler's ounces, are each 480 grains. So, in answer to another question—Which weighs more, an ounce of feathers or an ounce of gold?—the answer is an ounce of gold because troy ounces are used to measure gold.

**Never mind global warming.** The world is currently in what climatologists call a *glacial age* which is marked by many cold periods, called *glaciations* or ice ages, that average 60,000 to 90,000 years. These ice ages are separated by *interglacial* periods of relative warmth that average only 10,000 to 40,000 years. We have been in the current warm period for about 13,000 years and no one knows when it will end. And climatologists know we won't get much warning when it does because the geologic record shows that the freezing starts with a bang, not a whimper, and the earth will go from warm to cold, complete with huge glaciers, in less than one generation.

Such an event would not come about without consequences to humanity. It's likely hundreds of millions, if not billions, would die due to starvation as crops failed and, depending on the severity of the freezing, it could mark the end of civilization altogether.

**Eat your veggies.** Before 1492 no European had ever eaten a potato, a tomato, a squash, a hot pepper, an ear of corn, or even a single bean. They are all New World plants and were never seen in the Eastern Hemisphere before Columbus and other explorers brought them back. (Apologies to Leif Eriksson, or any of the other Norse explorers, because no one knows what they ate when they were here.)

However, of all the items, plants or otherwise, Europeans found in the New World, none spread faster than the hot pepper. Within 20 years of Columbus' landing in the Americas, the hot pepper was being cultivated and eaten in China.



# NUCLEAR TERRORISM



How the bomb works...

...what happened in Hiroshima and Nagasaki...

...what will happen if terrorists detonate one here...

...how terrorists may get their hands on the bomb

From the events of September 11 we have learned the extent to which terrorists are willing to go to commit an act of terrorism. They are willing to hijack planes and use them as suicide bombs, killing themselves along with thousands of innocents.

It is conceivable that, in the case of Moslem terrorists, the most ardent among them imagine starting a worldwide jihad, or holy war, involving Islam and the West. This, at least, seems to be what Osama bin Laden and his band of thugs, al Qaida, had in mind.

However, the reasons for such terrorist attacks are not part of the scope of this article nor are the solutions, except to say that, though some of our politicians would like us to believe they committed their act of terrorism because of economic envy or a loathing of our freedoms, the fact is that the attacks are a response to American foreign policy in the Middle East and an attempt to force us to change it.

What *is* within the scope of this article is one of the means by which terrorists may one day conduct their attacks, namely, using nuclear bombs.

There is no doubt that the devastating American response to the events of September 11<sup>th</sup> was not what the terrorists expected. However, our response does not mean that terrorism will go away. On the contrary, because of what many call “the law of unintended consequences,” as a result of our decisive response we

may find ourselves confronted by even greater acts of sabotage and destruction as terrorists attempt to up the ante in the hope of gaining whatever political, philosophical, or religious objectives they may have.

And that’s about all they can hope to achieve. Here in the early part of the 21<sup>st</sup> century no terrorist organization nor any countries that harbor or sympathize with them could conceivably mount an attack that could “defeat” the United States. We’re not going to be invaded. And it’s also unlikely that any of the terrorists are acting as they do because they imagine invading us is possible. More likely, they assume that an attack of sufficient magnitude will change American foreign policy into something they find more desirable.

There are possibilities of more terrorist attacks employing more terrifying methods. But it’s not likely we will find ourselves enduring random local explosions, the likes of which are used by terrorists in Israel. Ted Kaczynski and Timothy McVeigh notwithstanding, those kinds of sustained bombings require a large domestic terrorist base which isn’t yet present in the United States. (This isn’t to say there won’t be one in the future.)

Up the scale from random bombings is the possibility of biological or chemical terrorism. These attacks are more worrisome than car and truck bombs because an epidemic of small pox or some other disease may become self-sustaining as it sweeps

### Definitions:

The words used when talking about “the bomb” are sometimes used interchangeably, though there is some consensus. For example, *atomic bomb* is sometimes used to describe just fission bombs—those that use only uranium or plutonium; other times it’s used to refer to both fission bombs and fusion bombs—those that derive most of their power from fusing hydrogen. For this article the words are used as follows:

**Atomic bomb** — a *fission* bomb, one that derives its power exclusively from the splitting of uranium or plutonium atoms.

**Hydrogen bomb** — a *fusion* bomb that derives most of its power from the fusing of hydrogen, though all hydrogen bombs are triggered with fission bombs.

**Nuclear bomb** — the class of bombs that includes both fission bombs and fusion bombs.

**Thermonuclear bomb** — a hydrogen bomb, so-called because they are triggered by the thermal radiation created by the fission bomb that gets them going.

There are other terms used such as dirty bomb and neutron bomb, but they are explained in the text.

across the country. Dave Duffy addressed the prospects of this kind of terrorism in his *January/February 2001* article titled, *Biological & chemical terrorism*



As he points out, the infrastructure required to conduct a biological terrorist campaign may well be beyond the scope of any contemporary terrorist organization or their covert sponsors, and the start of an epidemic may be stemmed by medical aid and sanitary practices which could quickly be put in place.

But at the top of the scale, and the most fearsome of the possible terrorist attacks, is nuclear terrorism. And of all of the acts terrorists may engage in, this is the one that, though it's not likely to bring about the fall of the West, will most likely bring on the utter death of freedom—whether or not it brings on the change in American policy they desire.

And, almost as bad as actual nuclear terrorism, may be just the *threat* of nuclear terrorism. In fact, just trying to prevent such an attack may spell the end of freedom as we know it.

We could lose it all because of some crazy terrorist and a mushroom cloud. And we could lose it forever. We could trade away our rights for the feeling of security. It would be like George Orwell's *1984* where the government has become a dictatorship and justifies it with the excuse that a constant state of war exists.

## Types of bombs

With the exception of what are now called "dirty bombs," nuclear terrorism is all about "the bomb." There are several types of nuclear bombs terrorists could employ and several ways they could use them. The bomb types depend on the materials they have available, the technology they have for producing one (if they don't just out-and-out steal one or buy one on the black market), and the size of the explosion they want to make—though there's no doubt that their philosophy will be "the bigger the better."

Militarily speaking, nuclear bombs are classified according to the size of

### kilotons vs. megatons

The explosive effects of nuclear bombs are so much greater than any of the explosions mankind's weapons had created before that there was little to compare them to. But right from the beginning it was decided to equate them to how much TNT it would take to create as much damage, and it was estimated that the bombs dropped on Hiroshima and Nagasaki were the equivalent of dropping 10,000 to 20,000 *tons* of high explosives—TNT—on each of the cities. It would have taken at least 3,000 of World War II's largest bombers, the B-29s, to drop what the lone B-29, the *Enola Gay*, dropped on Hiroshima. The Greek prefix for thousand is kilo, abbreviated "K," therefore the bomb dropped on Hiroshima was estimated to have the explosive equivalence of 10K to 20K of TNT.

Thermonuclear bombs are thousands of times more powerful than atomic bombs so their equivalence is measured in *millions* of tons. The Greek prefix for million is mega, abbreviated "M."

Several of the countries that currently belong to the "nuclear club" now have bombs (deliverable by missile or bomber) that are more than 1,000 times as powerful as the bombs dropped on Japan.

the explosion they create, which determines the military use to which they will be put. The smaller ones are referred to as tactical and the larger ones as strategic.

**Tactical bombs**, sometimes called battlefield nuclear weapons, are small-yield nuclear devices meant to cause local destruction. Their beauty, from a terrorist's point of view, is that they are small enough (some of them were meant to fit into artillery shells) that some could fit into a suitcase and some may fit into something as small

as an attaché case. The smallest bomb made by the United States is called a "Davy Crockett." It's a 0.1K (kiloton) bomb weighing 51 pounds and meant to be fired from a recoilless rifle that could be mounted on a jeep.

The radius of destruction of such a suitcase-size weapon depends on the amount of energy the explosion produces. This is called its "yield." If a single tactical nuclear weapon like this had been brought up to one of the top floors of either of the WTC towers, it would have acted like an airburst (this is the kind of explosion that causes the widest possible area of destruction) that not only would have destroyed both buildings, killing almost everyone in each, but it would have killed most people for a radius of several blocks. Depending on the time of day it was detonated, such a weapon could have killed hundreds of thousands of people.

Similarly, a larger bomb of this type, on the scale of the bombs dropped on Hiroshima and Nagasaki, could be fit into a car as small as a VW Bug, parked several blocks from the White House and Capitol Hill and detonated during the President's State of the Union Address, or some other event, killing most of the heads of our government. Or similarly, it could be flown at a height of two thousand feet over the capital, to effect an airburst, wreaking devastation on the scale of that we wrought at Hiroshima and Nagasaki to conclude World War II.

**Strategic bombs**, sometimes called "thermonuclear" or "hydrogen" bombs, are more powerful than the atomic bombs dropped on Japan. Thermonuclear bombs are much larger both in the size of the bomb itself and the size of the explosion they create. Some of these devices could destroy entire cities.

It is the actual securing of one and then delivering it that could pose problems. But their use by terrorists can't be completely ruled out.

The differences between atomic and hydrogen bombs is that an atomic bomb depends on fissionable matter, specifically uranium-235 ( $U^{235}$ ) or plutonium-239 ( $Pu^{239}$ ) to create an explosion, while a hydrogen bomb has, at its heart, an atomic bomb to get things going, but depends on the fusion of hydrogen into helium to generate most of its power.

The additional materials added to an atomic bomb to make it a hydrogen bomb are cheaper than the uranium and plutonium that go into making the atomic bomb, making hydrogen bombs, pound for pound, cheaper.

Furthermore, there's really no limit to how big of a hydrogen bomb you can build.

## Getting a bomb into the U.S.

The most likely way to get one of these bombs into this country would be the same way drugs are brought in: a small plane (especially one landing at a remote airstrip) or a boat.

It is possible that either of these devices, a tactical or strategic nuclear bomb, could be brought into this country by boat, then detonated without off-loading it from the vessel. This was the delivery system suggested in the letter delivered to President Franklin Roosevelt just prior to World War II, and signed by Albert Einstein, in which Roosevelt was urged to embark upon a program to develop nuclear weapons before the Germans did.

Another delivery system could be to detonate a tactical nuclear weapon aboard a low-flying plane. A plane flying low over the heart of a city, or a crowded football stadium, would be guaranteed to kill in the tens if not hundreds of thousands. And if the crew delivering it is willing to die in the process—not an unthinkable scenario after September 11<sup>th</sup>—a bomb bay door isn't even necessary.

## Dirty bombs.

At one time this was the designation used solely for describing nuclear bombs that also disperse a large amount of radioactive residue upon exploding. Today it is also used to designate conventional bombs encased in radioactive material.

The blast and fire effects of a conventional "dirty bomb" are the least of such a bomb. There is no nuclear explosion with these devices. The intended effects are the dispersal of radioactive material. But it's unlikely a bomb set off by terrorists could send the material very far, and the number of people affected would be nowhere near the number affected by a real nuclear bomb or even a well dispersed biological agent.

Once such a bomb is detonated our strategy would be to avoid the area of contamination until we effect a cleanup. The real effect of such a bomb would just be terror.

**Neutron bombs.** These are the bombs that are supposed to kill people but leave property intact. It's worth knowing that *every* nuclear bomb is a neutron bomb, i.e., they all produce neutrons. Ordinarily, however, the radius of the blast is greater than the radius of damage done by the neutrons, so that almost everyone within range of the effects of the neutrons are killed by the blast, anyway.



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But in what we today specifically designate a neutron bomb, the bomb is made so as to minimize the blast effects while maximizing the emission of neutrons so that while there is still a nuclear explosion it's much smaller, but the number of neutrons is maximized.

The neutrons can be deadly, depending on how they interact with atoms that make up the cells in your body. Generally speaking someone exposed to a blast of the neutrons doesn't die immediately. Depending on the amount of exposure, death will likely come after a few days as the cells in the body die.

Neutron bombs were designed for the battlefields of Europe where, if Warsaw Pact armies were speeding across West Germany or other coun-

**Continued on page 68**

# Ayoob on Firearms:

## Sensible gun choices after September 11th

By Massad Ayoob

**M**any Americans responded to the terror of September 11 by arming themselves. Autoloading rifles and short barreled shotguns moved briskly, dealers tell me, and I saw gunshops where the handgun display cases had been all but emptied by the sudden demand.

The terrorist threat against America continues. The model of what to expect has been in front of us for years. We've seen it in Israel.

Again and again, when terrorists have opened fire in that land, armed citizens have drawn their guns and put a quick stop to it. It happened most recently a month or so after the attacks on the World Trade Center and the Pentagon. A terrorist opened fire in a bus, killing two and wounding several more. An Israeli citizen drew his semiautomatic pistol and emptied it into the murderer, dropping him. A soldier and guard arrived on the scene with M-16s and shot the downed gunman again just to make

sure. The local chief of police credited the armed citizen with saving many lives.

Lt. Col. David Grossman, the eminent authority on terrorism and mass murders, has suggested that off duty police and private citizens licensed to carry guns be sure to pack them when going to religious services. Grossman's research indicates that a particular sore point in the Palestinian consciousness is the massacre some years ago in Hebron in which a crazed Israeli militiaman with a government issue M-16 automatic rifle opened fire in a mosque, killing many Muslims and wounding many more. Grossman anticipates a response in kind, targeting houses of worship in the USA. Jewish synagogues would be particularly at risk. He also warns that sporting events, particularly in large arenas, are likely targets. Ditto large shopping malls, which many in "have-not" countries see as a symbol of American wealth and materialism.

I know one rabbi who is carrying a compact Colt Officers .45 auto. He has a customized Remington 11-87



**Massad Ayoob**

12-gauge semiautomatic shotgun with extended magazine, kept securely but accessibly in a discreet location on the premises. In another synagogue in another part of the country, members of the congregation have quietly gotten together to work out a plan of action should such an incident take place. Armed members are strategically seeded throughout the synagogue during services. All carry handguns, discreetly concealed. The weapons range from .380 autos and snub-nose .38 revolvers to .357 Magnums and service-size 9mm, .40, and .45 automatics.

### Rifles...

My sources believe Bin Laden and his puppets already have small, crude nuclear devices that they intend to use in our country. Such post-atomic devastation could leave survivors amidst a level of anarchy and chaos that has been predicted by survival-



*Five rounds of .38 Special +P in small, light package of S&W "hammerless" Airweight snubby is adequate for certain predictable "post-9/11" applications.*

ists since the early days of the Cold War. Facing starving criminals rather than enemy soldiers, a defender would find good use for the versatility of a semiautomatic military rifle. Caliber .223 makes much sense for the urban dweller. However, those assaulting a backwoods home would likely have come by vehicle, and the steel-penetrating ability of the .308 Winchester cartridge (7.62mm NATO) would make it a better choice.

A number of good auto-rifles in this caliber are readily available. I serve a rural community, and on “Y2K night” when it was predicted that a massive power shutdown could trigger a wave of bank robberies, I sat stakeout on two adjacent banks armed with a match grade, telescopic sighted Springfield Armory M1A. Loaded with a 20-round magazine of .308 and backed up by more, this would have been an ideal tool for the task. Fortunately, nothing happened.

## Shotguns...

For close-range home defense, the shotgun loaded with buckshot is hard to beat. A short barrel pump gun with extended magazine, delivering seven-to eight-shot shell capacity, is also quite affordable. Loaded with rifled slugs and equipped with good sights, the shotgun can reach out to a hundred yards or more, but still isn't quite as versatile in this application as a rifle.

## Handguns...

September 11 found my wife and elder daughter trapped in Las Vegas with no planes flying. Fortunately, my wife holds a Federal Firearms License, which allows her to purchase handguns anywhere in the country. I faxed her a copy, and a visit to a local gunshop equipped her and my daughter. Two attractive women traveling alone by ground are an inviting target for all sorts of indigenous predators. The technology



*Ayoob sights in his Glock 17. With pre-ban magazine and +2 adapter, it holds 20 9mm hollowpoint rounds.*

she chose was simple: the Smith & Wesson .38 Special revolver, hammerless and Airweight. Such a gun can be fired through a coat pocket without snagging, is easy to conceal and constantly at hand. For a while, even rental cars were not to be had. If they'd had to hitch-hike, a small .38 apiece would get them home safely.

On my first post-attack trip I was almost 3,000 miles from home, and the Taliban was threatening that “the rain of airplanes” would continue. Another shutdown of mass transportation would leave me hitch-hik-

ing a long way with what I could carry by hand. The 9mm cartridge—adequately powerful in the 115-grain high velocity Pro-Load Tactical ammunition I chose—made sense. I could carry more of it if it was impossible to resupply. During that trip I carried a Glock 17, loaded with 20 rounds thanks to a pre-ban magazine with +2 extender. On the hip were two spare magazines, each with 17 rounds. In an Alessi ankle holster was my backup gun, the baby Glock 26 fully loaded with 11 rounds of the same ammunition. It would feed the longer magazines of the bigger 9mm in an emergency. Carrying two lightweight guns with polymer frames, and 65 rounds of ammo on my person, was no problem at all.

A later trip included a swing through California, where a technical reading of that state's new law indicated that it might be illegal for me to bring in a high capacity magazine not registered there. I simply went with an eight-shot 1911 .45 pistol, and a five-shot .38 Airweight revolver for backup.

In the end, when you face the sort of crisis that requires a defensive firearm, the question isn't so much, “Did you have the ideal gun?” The question is more, “Did you have a gun at all?” Δ



*Kimber Custom II .45 is adequate to any defensive handgun task. The author's has just given him a 60-shot qualification course group that, measured by the blade of his Ayoob Spyderco tactical folding knife, is just under four inches.*



## Reality confirms need to arm pilots

By Massad Ayoob

**O**n December 13, 2001, an alert *Backwoods Home* reader named Randall Stroud alerted Dave Duffy and me to the fact that a retired pilot, living in North Carolina, had thwarted a jetliner hijacking in the 1970s by drawing his gun. Mr. Stroud gave us the contacts, and I got in touch with the pilot, Captain Glenn Hieronymus.

The incident was never publicized. Hijacking of airplanes—they called it “skyjacking” back then—had become the trendy front-page crime. Every strange ranger whose voices told him to stop taking the Lithium seemed to be acting out his psychotic break by threatening a flight crew with a makeshift or non-existent weapon and demanding, “Take me to Cuba!”

Federal law enforcement and the airline industry and the pilots’ association all agreed on one thing: publicizing these incidents fueled the fires of weirdness and created copycat crimes. It was tacitly decided by the powers that be to keep these incidents quiet unless they blew up so badly that the press got hold of the story on their own. Thus, Capt. Hieronymus has no documentation of the incident. However, I spoke with one of Lethal Force Institute’s staff consultants, Bill Goldstein, a retired pilot who was active during the same period. Bill recalls the scuttlebutt that circulated after Hieronymus drew his gun to prevent the hijacking of a Piedmont Airlines flight that had just taken off from Fayetteville, NC, en route to Chicago, IL, with a stop in Richmond, VA.

Before takeoff, a stewardess (as flight attendants were known back then) advised Hieronymus that one passenger seemed to be acting strangely. Since he was not being violent or abusive, the captain couldn’t kick him off for that, but he

instructed the crew to keep an eye on the man. Hieronymus knew that one passenger on board was a Green Beret; he covertly asked that man to move up to a seat near the pilot’s cabin, just in case.

The 737-200 jet with 87 passengers and four crew on board had not quite yet leveled off when the suspect passenger, six-feet-something tall and somewhere around 190 pounds in weight, went bonkers. Uttering strange, dog-like barks he left his seat, backed a flight attendant into a galley, and smashed her against the galley wall and held her in place. He wanted to go to Russia, he screamed, and he demanded that she call the pilot’s cabin to find out if there was enough fuel on board. The terrified attendant did as she was told.

As the pilot notified authorities on the ground and worked to quickly level off the flight path, the co-pilot went aft to try to help. He was chased back to the cockpit by the hijacker, who drew from his Afro hair-do a sharpened comb. This was one of the “in” street weapons back then.

I was a young police firearms instructor during this period, and remember vividly that in the mid-70s a popular training film called *Shoot/Don’t Shoot, Part II* made the rounds of almost every police academy in the nation. In that film, an offender draws a sharpened comb from his Afro and slashes a police officer’s throat.

The co-pilot made it to safety with the attacker so hot on his heels that the hijacker’s hand was caught in the door as the pilots slammed it shut. Knowing that almost a hundred men, women, and children were on board and helpless against the psycho’s fury, Captain Hieronymus turned control of the plane over to the shaken co-pilot, and moved to deal with the problem.

Captain Glenn Hieronymus reached to the small of his back and drew a snub-nosed Smith & Wesson .38 Special revolver from a holster clipped inside his waistband. Flinging the door open with his left hand, he leveled the loaded gun on the suspect with his right. Still wielding a makeshift edged weapon, the startled hijacker jerked back. Seeing rage in the man’s face and believing he was about to renew the attack, Captain Hieronymus cocked the hammer of the .38, aimed at the center of the man’s chest, and prepared to fire.

At that moment, the Green Beret swung into action. He grabbed the hijacker’s belt from behind and jerked him off his feet. There was a flurry of movement, and then the hijacker was unconscious due to head trauma, his weapon lying harmlessly on the floor. No shots had been fired. The subject was subdued, and the pilot de-cocked and holstered his weapon. An emergency landing was made at Richmond, and police swarmed onto the plane and removed the suspect. A short time later, the plane took off, with Captain Hieronymus still at the controls.

Don’t you love happy endings? Compare that to the horrors of the four jetliners that went down on September 11, 2001. There were no guns in the hands of the “forces of order” on board those planes. Box-cutters were sufficient to allow the terrorists to seize control of the giant jet planes, turn them into flying fire-bombs, and send thousands of innocent American citizens to their deaths.

In the first few years of my school, Lethal Force Institute—the first half of the ’80s—airline pilots were among the most highly represented non-police professions. No one knew how many pilots carried guns into the cockpit then; they were allowed to bypass Security. Snub-nose .38 revolvers like that used by Hieronymus were the most popular,

followed by .380 automatic pistols like the little Walther. Then a disgruntled employee of a small West Coast airline used his ID card to bypass Security and get on board a commuter flight with an undetected .44 Magnum revolver, and shot and killed the pilot. The plane crashed, killing all aboard, and suddenly pilots were forbidden to be armed on the planes. Ironically, in the first half of this century, armed pilots were more the rule than the exception; they were widely required to carry guns when flying commercial aircraft.

Had that rule been maintained, the carnage of 9/11/01 would have been profoundly mitigated and perhaps even prevented altogether. There is now strong impetus, from both the more intelligent legislative quarters and the Airline Pilots Association (ALPA) itself, to reinstate the practice of arming pilots. There is precedent for this in the U.S., as you've seen, and there is reason to believe

that the pilots of Israel's El Al and Russia's Aeroflot have been carrying guns for some time now.

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It is time to arm (and, of course, appropriately train) the pilots. The martyred American dead of September 11 cry out for it, and so does logic itself. Your delegates on Capitol Hill need to hear it from you.

Thanks again to Randall Stroud for bringing this story to our attention. He proves that the readers shape the magazine. Δ

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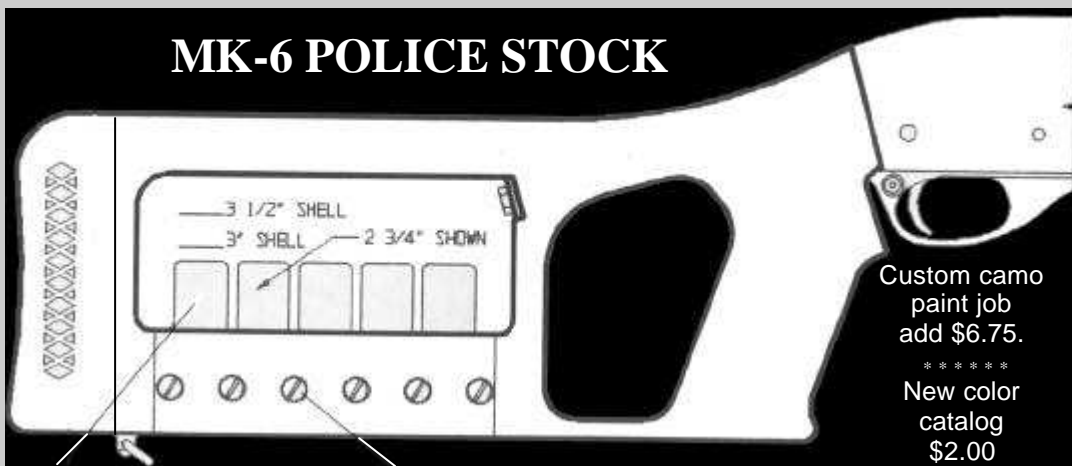
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# *Harvesting the wild*

hunting and using  
deer, elk, and moose

By Jackie Clay

A lot of us self-reliant folks, especially those of us now living in the woods somewhere, hunt and forage for a part of our food. Although we raise a steer for beef and have poultry to butcher, we also hunt wild meat to “fill in” for those years that we don’t butcher a beef. I try to never let my pantry of home canned meat get too low. It isn’t provident—or safe.

Now I’m a 55-year-old grandma with a bum ankle. I can’t kill a chicken (Bob does the dirty work.), but I buy my license and shoot a meat animal. I love the hunt, but I hate the killing and feel sorry for taking a life. I guess it’s a complex issue.

I took my son, David, with me this year. He needs the practice in being quiet and learning the ways of the hunt. The hunt didn’t last long. An hour before sunset, we spotted a nice fat forkhorn buck on the slope of the canyon. I’m one of those old-timers, I guess. I hunt with a Winchester .30-30 with open sights. I don’t shoot long distances. I try to place myself on a game trail or stalk browsing animals. And I’m Scotch with ammunition. I’m still on the same box I bought in 1990, and we’ve eaten an elk, several deer, and more from it. I shot my buck and restrained David, who wanted to go “chase” him.

After 10 minutes, I let him go find the buck. He needed the experience. And while he went, I thought maybe some readers, new to the woods, might like a few hints on hunting, dressing out an antlered game animal, cutting up the meat, and home canning it to stock up the pantry.



*Jackie Clay stands proudly with her Winchester .30-30 and buck.*

We won't get into weapons. Everyone has his or her opinions here—pretty darned strong opinions. We have several rifles, along with a shotgun and slugs, and bows and arrows, and all have put meat in our pantry. It's not so much the weapon, but what you do with it.

Learn to get close to game. I know northern Indians who have killed bear and moose with a .22. I sure wouldn't

recommend such a light rifle for big game, but it has been done. Pick a weapon adequate to the game you will be hunting, and get plenty of practice at shooting it under all conditions and positions. Become accurate with it at varying distances, but forget those long shots. You don't want to wound an animal that escapes and dies a miserable death. That is not hunting; it is stupidity and cruelty.



*Bull elk in early morning fog*

## Finding game

The best way to ensure a successful hunt is to do a lot of scouting before the season opens. As we live in the woods, this is easy for us. By simply spending a lot of time out in the mountains, we learn not only what kind of animals are out there, but which ones. We get to know their comings and goings intimately. This cuts a lot of corners and saves much time when we go out carrying a rifle.

My hunt this year lasted an hour. Yep, I was lucky. But I also knew where the bucks came down the canyon in the evening looking for does with that "come hither" look in their eyes.

**Deer.** Although there are several species of deer in the U.S., deer generally behave like deer. During the day, they'll often lay up in sheltered wooded or brushy spots. Mule deer favor canyons and rocky areas wooded with pine and fir. Eastern white-tails like islands in lowland swamps and points of high ground near brushy lower land. Water will usually not be too far away for either species.

It's tough to hunt deer in the daytime, as one often spooks them as you walk through the woods or they just sit tight and do not move about. But in the early morning and early evening, they will usually be found strolling toward a grassy meadow to fill up on grass and browse. It's here the hunter can make meat.

By taking a stand near an open spot on a deer trail leading from the woods to a meadow, with the wind from the woods to you, you can often watch deer come and go until your choice shows up. While there are many tactics to becoming "invisible" to deer, the best are to remain absolutely quiet, moving very slowly when you must and not smelling like a human: no tobacco, no booze, no perfumed soap, no perfumed deodorant, no dryer-dried clothes.



We do not smoke or drink alcohol. I line-dry all our clothes so there is no dryer odor. I throw my hunting jacket, hat, and boots in a feed sack with a few pine boughs a week before season. We use homemade lye soap, which has very little odor.

I've had deer pass within five feet of me, wearing hunter orange, and never know I was there. On a bet, I got out of the truck without my rifle, got down on all fours and approached a deer that saw me from the start. And by imitating a fawn's bleat, I got that deer to come so close I could slap it. No special attractant or scent masking. Just no human scent and plain deer curiosity.

In many areas of the east, whitetails are hunted most effectively from a tree stand. For us, this was simply a few planks nailed seven feet up a well-branched tree. If you choose this method, locate the stand on the edge of the woods where you have seen deer come and go, plus there are plenty of deer signs, weeks before the season begins or they will notice it and shy away. When on the stand, stay absolutely quiet. Wear warm boots, as your feet will often get cold due to inactivity.

With any hunting, take your time shooting. A heart-lung shot is always best; never shoot at a deer running away from you. You are making meat, not slaughtering an animal. The most meat is in the hind quarters; don't take a chance at ruining it. If the deer is spooky and trotting away, you can often stop it by imitating a fawn's bleat, which sounds like a kid goat's. I've not only stopped a buck this way, but had them actually turn and come back toward me.

**Elk.** Elk are harder to hunt than deer. They are more wary, quicker to stampede, and less apt to return once they spook. In much of the West, you'll find elk at higher elevations during bow season and early rifle season. The cold weather and heavy snow usually drive them to lower ele-

vations—below 6,000 feet—in late rifle season.

Look for elk near heavy forests, intermingled with open areas. They graze more than deer, but also eat brush tips. Elk are seldom far from water. In the rut, bulls often dig up a wallow in which they urinate and churn up, rolling in to perfume themselves. They also use the wallow and creek bottoms to cool off after a harem-saving battle or chasing cows in estrus.

Besides looking for tracks and elk-berries, be aware of elk scent, which is a sweetish fragrance. In heavily used areas, such as favorite meadows and bedding grounds, you will notice this aroma. It will be a good area to hunt, later on.

Like deer, elk are seldom seen during the day, even less so than deer. Elk drift into meadows to graze very early in the morning, even before it is light, and usually leave just after daybreak. They show back up in these meadows just at sundown, grazing until after dark. During the day, they

usually bed down in canyon-like rocky areas with tree or heavy brush cover where they can leap up and be gone at the slightest disturbance.

Your best chances of getting an elk are found by either ambushing your choice on his/her way to or from a grazing meadow or waiting for "city" hunters to drive a herd up from a lower elevation. You'll have to learn where the herds flee into heavy forests and what paths they usually use. Elk are creatures of habit and you can use this to your advantage.

While you may be tempted to shoot at any part of an elk you can hit, wait until you get a head-on or broadside shot and be sure you kill the elk, not simply wound it. We watched a young bull elk limp around with a broken hind leg all winter, a victim of a poor hunter's quick shot. His leg healed, but most are not so lucky.

**Moose.** The moose is the king of deer, inspiring awe in anyone who runs across one in the forest. Huge and black, his antlers spread out better than five feet. And he is the tasti-

## Steps in skinning a deer, elk, or moose



1. Cut around each leg with a sharp knife. Don't cut down on the hair, but poke through the skin and cut up from underneath.
2. Cutting upward again, cut from leg cut, up inside of leg to center belly cut.
3. Cut high around neck, then down throat to cut at brisket.
4. Pull hide away from carcass while gently cutting along carcass with very sharp knife. Use "sketching" cuts, rather than hacking. You can use a good hide for many projects. One full of holes is just about worthless.
5. I skin out both hind legs, then work on neck, front legs and shoulders. A helper is great at hurrying up the job, pulling on the hide as you skin; a hide will almost rip loose without cutting.
6. As in removing a coat, pull the hide down from the shoulders and back, toward the hind quarters. Much will pull loose without cutting. At the tail, pull the hide very hard and most of the tail will turn inside out. Cut the bone and the hide will be free.
7. Use a hose or buckets of clean, cold water to rinse the carcass off, inside and out. It will remove most of the clinging hair, as well as cooling and cleaning the meat.

*Top: Cut around leg with sharp knife. Middle: Don't cut down on the hair but poke through the skin and cut up from underneath. Bottom: Use "sketching" cuts, rather than hacking.*

est of all wild game meats. Unfortunately there are more hunters all the time, and in many areas, one must draw for a moose license.

Should you be lucky enough to live where you can hunt moose, or you are lucky in the drawing and get a moose license, you have a good chance of making a mountain of meat.

Moose are easier to hunt than either deer or elk. They are so big that they have few enemies and regard man as an annoyance. Bulls in rut will quickly convince you that it is their woods. They have chased hunters right to their trucks. Sort of looking like a black locomotive with antlers, one does have to respect their power—and touchy disposition.

While moose will take to the high ground forest during the day, they will usually be found in lowland, swamp, lakeshore, or rivers. Moose browse on willow brush, leaves, and water plants, even underwater. Unlike hunting deer and elk, it's not generally too hard to find a moose. One only needs to make a sure, killing shot in a decent place to dress the animal. Don't shoot a moose in a lake or fast-moving river, as you might not be able to retrieve an 800 to 1,200-pound limp body in deep water.

Take into consideration, also, how you will get the dead moose to your truck. You can't drag him. Even quartered, he weighs a lot. The time to think about this is when you see him standing there, not when he's down and dead.

## Field dressing

Once the animal is shot and it does not fall dead, wait five minutes if you're reasonably sure you put in a good shot. With a heart-lung shot, the animal will often trot off 100 feet and drop dead. This is why you should not charge after it. Once the adrenaline surges, a dying animal can run a long way before dropping. If you do



*Removing front quarter*



*Remove hind quarters with saw or sharp hatchet and knife.*

not blast away after it or run after it, it will simply stop.

After your five minute wait is up, go to the spot you shot the animal if you did not see it drop. Then, cautiously, follow the trail. When you see the animal, stop and wait. Is it still breathing? Hunters have been injured by walking up to a "dead" animal and bending down to begin dressing it, only to have it leap up and charge over them. Not a pretty picture, especially when it is a big bull elk or moose.

If the animal is dead, immediately tag it and begin field dressing. The

longer you leave the entrails and blood in the body, the worse the meat will taste.

It does little good to cut the throat on a dead animal. The heart has stopped pumping blood. I usually begin to dress an animal by propping it up on its back and holding the belly skin, in front of the pelvic bone, up away from the body. By gently poking the tip of the knife into the skin, I can open it a few inches. Then gently cut, with the blade upward, poking down into the abdominal cavity. You don't want to hack into it, or you will



spill stomach and bowel contents onto your meat.

Cut all the way up until you hit the brisket. Then carefully split the pelvic bone with a small saw, a hatchet or (shudder...but I've done it) rap the back of your hunting knife with a rock until you've driven it through the bone. Again, very carefully, cut around the rectum, pulling it free enough to tie off. If this is tied well with a cord or even a green willow shoot, the contents of the bowel will not accidentally fall onto your meat.

If your animal is a male, carefully cut beside the testicles and penis. Now, by reaching all the way into the abdominal cavity, you can pull and shove. The entire lower "gut pile" will roll out in one lump. Gravity is a great aid here, especially with a huge animal. By either hanging the animal, head up, in a tree or on a pole, or even having it on a slope, the gutting will be much easier.

Reach into the upper body cavity and rip or carefully cut through the diaphragm. Reach as high as you can and cut the esophagus and pull down, removing the lungs. The entire insides are now outside; you are ready to head for home. If there is snow on the ground or clean, running water nearby, rinse out the abdominal cavity. This will not only remove most of the blood but it will wash away any "mistakes," such as a punctured stomach or colon.

## Getting it home

A deer is easy to get home or to your truck. Most of the time you can simply put a rope on its head and drag it over the grass. But if the ground is rocky, the brush thick, or you have far to go you will not only kill yourself this way but you will probably bruise up the meat pretty bad. Instead, roll him onto a kids' plastic toboggan. Tie him down, if necessary, to keep him there. Then drag him out on that. He'll slide right along over rocks and brush.



*Hosing removes hair and debris, and it also cools the meat.*

A moose or elk is another story. But, again, you don't want to drag them far, even with a horse, ATV, or truck because you'll bruise up the meat. If you should be lucky enough to have killed a large meat animal near a road or trail, you can simply fasten a come-along to the animal's head, with the other end to a front stake pocket of the truck and, by lowering the tailgate all the way down, jack your meat-on-the-hoof right in the truck bed.

But, unfortunately, most moose and elk are shot a good distance from any drivable trail, so skinning and quartering the animal on the spot is the only viable option.

Now, when one quarters a big meat animal in "civilization," a person simply skins it, hanging from a tree or pole, then saws the head and lower legs off and neatly splits the carcass right down the spine. When you have a 500-pound or better chunk of meat lying on the forest floor, things are a bit different.

First skin the animal (see instructions), then remove the lower legs and head, high up on the neck. Be careful not to get the meat side of the skin dirty, as this will be our tarp on which to stack your quartered meat.

I begin field quartering by removing both front shoulders with upper leg attached. This is most easily done if you have a helper to pull upward on the leg while you cut under the "armpit." If not, get creative; tie it up with a piece of cord or rope or get your shoulder under it and heave upward while you slice.

The shoulder is not fastened to the carcass with a bone joint, so it is very easily cut free. Just carefully slice under and around the leg and shoulder blade until it is free.

Lay the first shoulder on your clean skin (hair side down). Repeat with the second leg. See, the carcass now looks a whole lot smaller.

Few hunters carry a meat saw into the woods while hunting elk or moose, me included. And those small folding knife blade saws are worthless. But I do carry a sharp hatchet on my belt. With your knife cut as much of the hind quarters free as you can, until you hit bone in the spine. Take your sharp hatchet and carefully chop the spine in two. By tucking your hide tarp under the hind quarters, you can pull the entire hind end onto the tarp to finish your work so it doesn't get full of grass or leaves.

Now cut down the top of the meat, directly over the spine, all the way to



the tail, using first your knife, then your hatchet. In a few short strokes your hind quarters will separate and fall to your hide. This leaves the neck and rib cage. On the top of the rib cage, lying on each side, are the backstraps, one of the choicest cuts of meat. And on the inside top of the rib cage are the tenderloins, the very best meat on the entire animal.

I fillet both the backstraps and tenderloins out in one piece each. Some people have bone-in steaks made; the backstraps and tenderloins are the “meat” in the steaks. But we prefer our game meat totally boned, and I do not pack out more bone than necessary.

To fillet the backstraps, slip your knife along the ribs, all the way to the spine and work it along the entire length of the backstrap, from shoulder to back end. Then lightly cut down from the top of the spine, holding the cylinder-shaped backstrap away from the rib cage as you cut. Lay this on your hide tarp and repeat.

The tenderloin is filleted in the same manner, only from the inside of the rib cage. It is the long, dark strip of meat, lying on each side of the underside of the spine, not nearly so large as the backstrap.

If you are in bear country, drag your hide tarp full of meat some distance from the gut pile. Bears, especially grizzlies, are getting so they are attracted to the sound of rifle fire, knowing there will be at least a gut pile to gorge on. I don’t want to become a statistic.

There are several ways you can get your meat out of the woods, depending on how far you are in, and where you are. Moose are most often killed near water, so a canoe is handy to pack out the meat so you can get it to a place where you can load it into a truck. Lay a clean plastic tarp in the bow and center of your canoe and pile the meat carefully, taking time to balance your load. The hide can again be used to cover the load as protec-

tion against flies and insects. One caution: if you are taking the antlered head as a trophy, be sure you tie orange cloth over it or you may get shot.

Quartered elk may be packed out on horseback or on a plastic sled behind a snowmobile, person, or ATV or you can use a single wheeled game cart. I prefer using a horse, but realize not everyone has one available.

If you cannot pack out all of your meat in one trip, which is often the case, especially when you are taking that trophy head and antlers, along with that lovely hide, separate the meat into two loads. Tie the second load up in the hide and haul it several hundred feet from the gut pile, tying the bundle up on a rope, 10 feet from the ground. You don’t want to come back and find a bear has claimed your animal. Several Alaskan and Western hunters have had unfortunate encounters with aggressive bears guarding meat. Even a black bear, usually timid and mild tempered, won’t pass an opportunity to grab all the meat he can if it is lying about.

I take the best cuts on my first trip, just in case. If the day comes when I run across a bear standing over my meat, I won’t argue about it much. More than one hunter has been killed trying to drive an aggressive bear away from food. Luckily, this very seldom happens; I’ve never had a bear-hunter conflict of any kind.

## Keeping the meat in good condition

If the temperature is cool during the day and cold at night (below 40 degrees), it is a good idea to let the skinned carcass hang, covered with an old sheet, for a few days. This allows the meat to become more tender, just as good beef is aged naturally.

But if it is warmer, get that meat quartered, at least, and into coolers with ice. I love wild game meat, but I’ve had some *awful* venison. You

don’t go to the supermarket and buy a large beef roast, then carry it around in the trunk of your car or leave it lying on the deck for a week before you eat it. Of course not. But I’ve seen elk and deer hanging in a tree in people’s yards for a month or more of 60 degree weather. Yuck!

## Cutting the meat at home

While you can always take your deer, elk, or moose in to a game processing plant to be rendered into steaks, roasts, hamburger, and chops, you can easily save a few (quite a few, actually) bucks and custom-cut that meat right at home.

I do, and prefer to do the entire job, from hunting to canning, myself. I’m that picky. You won’t find a hair in my meat. No fat. No gristle. By cutting and processing my own meat, I know each piece intimately; it’s never “mystery meat.” And no one has ever mentioned a word about my game meat being “gamey” or not asked for second helpings.

Now you can cut your meat and freeze it in white freezer wrap if you wish, but I am totally committed to home canning my meat. Once properly canned, it is good, practically forever, unlike frozen venison, which must be used within a year or it will usually freezer burn. This renders it just about inedible because of the nasty taste. And canned venison is tender and pre-cooked, ready in only a few minutes.

When I cut my meat, I have three bowls. The first is for yucky scrap, such as bloodshot or bruised meat, hair, gristle and fat. The second is for meat to be ground, either for hamburger or sausages. The third is for stewing meat and steaks or roasts. This bowl is large and shallow so I can sort the meat as I cut—roasts or steaks to the right, stewing meat to the left. I bone all my venison. I boil moose bones for broth, but do not

like the flavor of elk and deer broth—it is much like mutton. One either likes it or doesn't. So all my bones go into a clean bucket.

I cut all my meat with a small, very sharp paring knife. Like I said, I'm terribly picky about cutting my meat, so I take twice as long as most folks do to cut up a game animal. I begin with the neck and work backward on the carcass, leaving the hind quarters to last. I believe this gives them more time to become tender, as I take at least two days to cut up an entire carcass, usually more, depending on the size of the animal.

All lean, connective tissue-free meat is cut for either stewing meat or steaks/roasts, depending on what I decide it would work best as—or what I need more. The steaks/roasts are cut into chunks about an inch thick, just a little larger than would slide nicely into a wide mouth canning jar. The meat will shrink while it is precooked.

Tougher meat and that with connective tissue, such as the lower upper legs, goes into the hamburger bowl. When done, I mix beef fat with this and grind it as lean hamburger. I used to use pork fat, but much prefer the taste of the beef fat in my venison burger. One tip here: if your meat and fat are just a bit frozen, it will grind much better. Warmish meat will be slimy when ground. A coarse grind makes great meat for chili. A finer grind makes regular hamburger.

The neck and shoulders are cut in chunks and slices, as seems best. The backstraps and tenderloins can be canned in roasts, leaving whole; only cut into jar lengths. Or they can be cut into boneless chops, an inch thick—better than prime beef.

The hind quarters are cut in slices around the bone, half at a time, top first, then the underside. As each slice is removed, trim it, then cut it to your

choice of cut—stewing meat or steaks/roasts.

## Home canning venison

I used to can my meat using the raw pack, which means that raw chunks of meat are packed into jars, to within 1 inch of the top. No liquid is added, only 1 teaspoon of salt per quart or ½ teaspoon per pint. The jars are then placed in a roaster pan holding enough water to come to the neck of the jar, but not higher. This water is simmered until the meat in the open jars is thoroughly heated. This is called exhausting and ensures that the meat is hot when the jars are capped and placed into the pressure canner.

While this works well, and is a fast method of meat preservation, I've switched to precooking the meat, instead.

The reason I switched is because the raw packed meat tends to dry out and is more stringy and hard to chew than precooked meat, canned with broth.

I put a tablespoonful of grease in a very large frying pan and sear the meat, steaks/roasts, then the stew meat. The meat is cooked until it is about half done. This shrinks it and heats it thoroughly.

I pack the meat into jars, using wide mouth jars for steaks/roasts, because they are easier to get the processed meat out of later on, and regular jars for stew meat and ground meat. The jars are filled to within one inch of the top. Then I make an unthickened brown gravy by adding about two cups of hot water to each tablespoon of fat/juice in the frying pan. To this, I add powdered beef soup base, nicely browning the gravy, and 1 tablespoon of dehydrated onion powder.

Pour this boiling broth over hot meat in jars to within 1 inch of the top. Wipe the rim clean, place a hot, previously boiled lid on the jar, and screw down the ring firmly-tight. Process pints in a pressure canner for 75 minutes, quarts for 90 minutes, at

10 pounds pressure if you live below 1,000 feet above sea level. If you live between 1,001 and 2,000, increase the pressure to 11 pounds. Increase the pressure to 12 pounds if you live between 2,001 and 4,000, and to 13 pounds if you live between 4,001 and 6,000 feet, and so on to 15 pounds at 10,000 feet.

I use the above method for stew meat, roasts, and steaks. The ground venison is pre-fried, but canned without broth or gravy. Much of it I make up as a recipe, such as spaghetti sauce, chili, taco meat, etc. And, of course, about half of my ground meat is made into sausages—summer sausage, pepperoni, and more, which I also home can—if there's enough left.

Check your home canning manual for exact canning directions or thumb through back issues of *BHM* for some of my canning articles.

But not all of my venison ends up as canned meat. If I didn't make up a good hefty batch of jerky, my family would move out.

## Venison jerky

While some folks use the scrap cuts of meat for jerky, I use some of the best. We like good jerky, and we don't like to gnaw on tough shoe leather that is jerky-flavored.

By choosing good cuts of meat and slicing it across the grain, you are assured of tender jerky.

My last deer provided one entire backstrap and about one third of one hind quarter's worth of jerky in three flavors. The flavor of all was excellent.

Today's jerky is sweeter and less hard than old trapper and Indian jerky. It's easier and quicker to eat, but it will not last a long time without either canning or freezing it. To home can your jerky, simply pack in wide mouth pint or half pint jars, **without liquid** and process the same as any meat.

There are probably as many recipes for jerky as there are for salsa—thousands, perhaps. And most are very good. One very easy and tasty recipe that our family likes is as follows:

**Quick smoky jerky.** Slice strips or pieces of venison or beef ½-inch thick across the grain. Trim off all fat; it will go rancid quickly. In a medium mixing bowl, mix ½ cup soy sauce, ½ cup Worcestershire sauce, ½ teaspoon coarse black pepper, 1 teaspoon ground garlic, ½ cup brown sugar, and ½ teaspoon of Liquid Smoke. Place the meat in the bowl and stir well. Press down so that most of the meat is entirely covered. Cover the bowl and refrigerate overnight (or 24 hours if a stronger flavor is desired). Stir every few hours during the day and keep pressed down. Drip the strips dry and lay on your electric dehydrator tray or place on wire cake cooling racks and put in your gas oven, set at 150 degrees, with the door propped open about an inch. After an hour, turn meat over and reduce the heat to 140 degrees. Dehydrate until the jerky is leathery and has no moist spots.

Put this meat in Zip-lock plastic bags to freeze or refrigerate for short storage times; you often won't need more, as we eat ours up pretty darned quickly. It's that good.

If your family likes spicy jerky, you can add ½ teaspoon of chili paste (not powder) or any other hot sauce to the marinade.

Now, besides all these great foods from venison, you can also make some dynamite sausage. I grind some with two thirds lean venison and one third pork fat, add salt, pepper, sage, and hot pepper, to our likes. You'll have to experiment with the first small batch. Mix it, going a bit light on the seasonings, then fry up some patties for breakfast. This will tell you if your mix is perfect or not. If you'd like some other mix, change your proportions.



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You can make any style sausage from venison, from pepperoni for pizza to spicy Italian sausage, following sausage making directions in any good sausage making book. I use *Great Sausage Recipes* by Rytek Kutas.

And, to carry this one step further, I can many sausages without liquid, in wide mouth pint and quart jars. It's true that many dry sausages will keep quite a while under cool, dry conditions, but I usually can up a batch, just to make certain I don't lose some of my precious meat. I'm sure that once you add hunting deer, elk, or

moose to your homesteading skills (or if you already have), you'll pick up a lot of ideas for using the meat when you cut up and process it at home. This meat is so good, so versatile, and so cheap it's a wonder that more folks don't hunt. My meat this year cost me a bullet, a hunting license, and a few hours of work. Δ

# THE IRREVERENT JOKE PAGE

(Believing it is important for people to be able to laugh at themselves, this is a continuing feature in **Backwoods Home Magazine**. We invite readers to submit any jokes you'd like to share to BHM, P.O. Box 712, Gold Beach, OR 97444. There is no payment for jokes used.)

## Jokes about men

"A Woman's body is a work of art. A man's body is utilitarian. It's for gettin' around. Kinda like a Jeep."

— Elaine on Seinfeld on why men shouldn't walk around naked

Q: Why do men talk so dirty?

A: So they can wash their mouths out with beer.

Q: Why is psychoanalysis quicker for men than for women?

A: When it's time to go back to childhood, he's already there.

## Jokes about women

Q: Why did God create Adam first?

A: So he'd have a chance to talk before Eve came along.

Q: Did you hear about the guy who finally figured out women?

A: He died laughing before he could tell anybody.

Q: Did you hear they finally made a device that makes cars run 95% quieter?

A: Yeah, it fits right over her mouth.

Two Redneck hunters got a pilot to fly them deep into the Alaskan wilderness to hunt moose. They were quite successful in their venture, and bagged four huge bull moose. The pilot returns, as arranged, to pick them up.

They started loading their gear into the plane, including the four moose. But the pilot objected. He said, "The plane can take out only two of your moose. You will have to leave two behind."

One of the hunters pushed forward, "Hey, last year our pilot let us take out four moose. It was the same model plane, same weather conditions, and everything. What's with this? We want you to allow us to fly out just like last year."

Reluctantly the pilot finally permitted them to put all four moose aboard and the men all climbed in with their gear. But when they attempted to take off and fly out of the valley, the little plane could not make it. They crashed in the wilderness.

Climbing out of the wreckage, one Redneck said to the other, "Do you know where we are?"

"I think so," replied the other Redneck. "Yep! I think this is about 100 yards further along than where we crashed last year!"

*A seal walks into a bar and asks the bartender for a drink.*

*The bartender asks the seal, "What'll you have?"*

*The seal replies, "Anything but Canadian Club."*

A construction worker walks into a bar. He's a huge, menacing guy. He orders a beer, chugs it down, and bel-lows, "All you guys on this side of the bar are a bunch of idiots!" A pall of silence falls over the bar.

He glares at them and asks "Anyone got a problem with that?" The silence deepens.

He grabs another beer, swills it down and yells, "And all you guys on the other side of the bar, you're all scum!" Again, the bar is silent.

He looks around belligerently and roars, "Anyone got a problem with that? Anyone?"

A lone man gets up from his stool unsteadily and starts to walk towards the man.

"You got a problem, buddy?" the construction worker asks.

"Yeah, I'm sitting on the wrong side of the bar."

*Taxiing down the tarmac, the jetliner abruptly stopped, turned around, and returned to the gate. After an hour-long wait it finally took off. A concerned passenger asked a flight attendant, "What was the problem?"*

*"The pilot was bothered by a noise he heard in the engine," the flight attendant explained, "and it took us a while to find another pilot."*

A circus owner walked into a bar to see everyone crowded about a table watching a little show. On the table was an upside down pot and a duck tap dancing on it. The circus owner was so impressed that he offered to buy the duck from its owner. After some wheeling and dealing, they settled for \$10,000 for the duck and the pot.

Three days later the circus owner runs back to the bar in anger, "Your duck is a ripoff! I put him on the pot before a whole audience, and he didn't dance a single step!"

"So?" asked the duck's former owner, "did you remember to light the candle under the pot?"



# STORING FUEL

By Rev. J.D. Hooker

A few years ago many folks made mistakes while making preparations for the big Y2K non-event. Some of these mistakes could have turned into major problems if a crisis had hit. I know folks who stockpiled gasoline, but because they hadn't stored it properly, six months or a year later they found themselves with nothing but "junk fuel" that fouled plugs and clogged carburetors and fuel injectors. This is a good time to take another look at these issues, and maybe learn a little from earlier mistakes.

Since most cars and pickups, as well as tractors, mowers, chainsaws, rototillers, and other equipment, are gasoline powered, keeping a supply of this fuel on hand is a wise decision. But you can't just dump gasoline into 55-gallon drums and expect it to keep for long periods of time.

For our own gasoline storage needs, we used to use metal 55-gallon drums because they are so easily grounded for extra safety. Now, because of problems with rust contaminating our fuel so badly at times, we use heavy plastic drums placed in simply fashioned wooden storage racks. For safety's sake, whatever sort of storage containers you select should be placed a fair distance away from your dwelling.

Much of the gasoline now sold is oxygenated. This type of gasoline does not store as well as non-oxygenated, so try to find gasoline without MTBE or ETBE additives.

Years back I learned that like kerosene, diesel fuel, and even heating oil, gasoline left straight as it comes from the pump simply won't stay good for more than a few months. But there are readily available, reasonably inexpensive addi-

tives that can greatly prolong the stability and usability of stored fuel. The first and most important of these is a fuel stabilizer. I like a product called *Sta-Bil*. Simply follow the guidelines on the label. If your stored fuel hasn't been used up in about a year you'll need to mix in another dose. We'll also routinely add "*HEET*" or some other water absorbing additive to every container of fuel that's set aside for storage.

Also, except for one fairly new chainsaw, virtually everything we own that's gas powered has grown to be pretty old now. Therefore we'll also add in one of the liquid "pour-in-type" lead replacers to each drum of gasoline. With newer engines this isn't needed. Should you find yourself needing to run both newer and older stuff, you'll need to be sure to select one of the lead-replacing additives that plainly states on the label that it's safe for catalytic converters.

Once we're ready to pour some of the stored gasoline into one of our pick-ups or other piece of equipment, we'll add *Gumout* or some other carburetor and fuel injector cleaner to the tank first. Plus, if the gasoline's been stored for more than six months some octane booster needs to be added as well. Once again, it's best just to follow the label directions when adding these. Two-cycle fuel (for chain saws, etc.) is simply mixed in one-gallon cans as needed.

Should you find it necessary to store more than one type of liquid fuel, I'd recommend you use some sort of unmistakable marking or color coding system. We use white drums for gasoline, blue ones for kerosene, and black for diesel. But any such scheme you prefer would work just as well, as long as you stick with it.

It also pays to keep in mind that, even after adding fuel stabilizer,

kerosene will usually produce an off odor when burned after several months of storage. So it's always wise to keep some kerosene deodorizer on hand for the times when you'll need to light up your heater or a few lanterns.

Propane (or LPG) is something of a different story. Whether kept in a relatively large bulk type tank like ours or in those portable gas grill type cylinders, this fuel never seems to go bad. In fact, the only real problems that I've seen regarding tanks of propane have been ruptured tanks (much more dangerous than most real bombs) usually caused through careless hauling, along with fittings that simply don't fit. I'm sure most of *BHM*'s readers already understand the importance of securely fastening or lashing propane cylinders before transporting them.

At the same time, all sorts of adapters for use with varying propane tank systems are cheap and readily available right now. You might want to try your local RV dealer or a plumbing shop.

I don't think I need to remind any *BHM* readers not to smoke around any of your stored fuel, but I've seen folks forget that things like kerosene lanterns, propane lanterns, and electrical tools (which **do** make sparks during use), are just as dangerous as lighted matches around gasoline, propane, and other fuels.

Also remember that any engine you intend on operating with your stockpiled fuel needs motor oil. Most farm supply stores, auto parts stores, and other retailers sell bulk oil in containers holding anywhere from one to 55 gallons at some pretty reasonable prices. With motor oil being much more stable in storage than just about any fuel, this can simply be kept as is in the original containers. This also applies to things like antifreeze, transmission fluid, brake fluid, tubes of grease, etc. Δ

# Tools and hardware for the backwoods home

By James Ballou

A certain degree of self reliance is obtainable by those who have the knowledge and skills, resourcefulness, courage, common sense, and tools to perform most of the tasks necessary to their own survival and way of life. Living any distance outside populated areas requires a greater level of do-it-yourself capability than within metropolitan areas, where citizens tend to live under a system of interdependence.

One of the reasons why I like tools is because I associate them with individual freedom. The proper tools can help people produce much of what they need, make necessary repairs to their equipment themselves, and maintain their own homes, farms, yards, gear, and machines. The more people are able to do themselves, the less they have to rely on others. Greater independence means greater freedom.

Obviously, having a vast array of tools and hardware alone does not make a person highly capable. Knowing how to use the tools is every bit as important as the tools are themselves. But having a healthy assortment of good tools can sure make life a lot easier, and anyone with the desire and determination can learn how to use them.

When you think about it, just about everything we do, whether it's brushing our teeth, cooking and eating, driving to work, mowing the lawn, tilling the garden, typing a letter on a typewriter or computer, or even talking to friends on the telephone, involves using some device you could think of as the tool for that particular

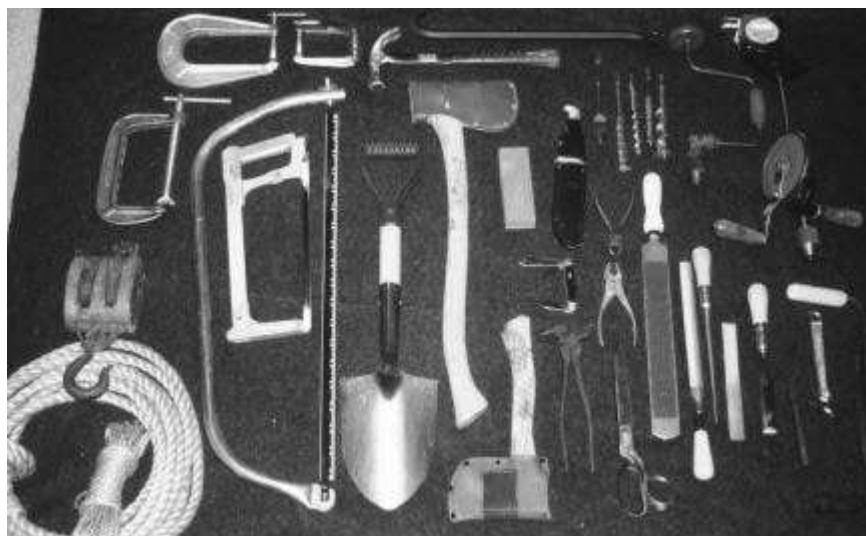
task. Modern folks are heirs to thousands of years of technological advancement in the sophistication of the tools we use. And we use many of them without much thought, often

taking them for granted. But without any of them where would we be?

Making a list of the necessary tools you should keep at the homestead can be quite a task. A mostly self-suffi-



*An anvil and forge can be especially handy for making and repairing other tools.*



*There are some basic hand tools no home should be without.*



*Gun maintenance tools*

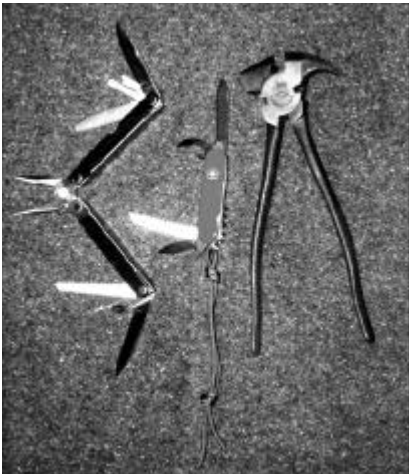


*Burning wood in the home can involve an assortment of wood gathering, log splitting, and chimney cleaning tools.*

cient country home can be expected to require equipment to serve a variety of different functions that are not generally concerns to most people who live in cities. The need for good tools in the country will always be great.

For the sake of order, you could categorize tools into groups according to their main application. At least it's a place to start, but you might want to reserve several pages for your list. It seems that every time I attempt to make a top-ten priority list of tools, I end up actually making a list of categories. For example, a wilderness backpacker will carry an assortment of tools needed on the trail and around camp, a mechanic will need an assortment of automotive tools, a carpenter will need building tools, and so on. Just listing the categories can get exhaustive, because within each category you might find subcategories. The carpenter category may include tools for rough framing, finish carpentry and cabinet making, tile setting, roofing, etc., each subcategory requiring its own specialty tools. Metal working might include machinist and lathe tools as well as tools for welding, blacksmithing, tinsmithing, and so on. And of course there are a lot of crossover tools as well. A simple pair of pliers might be just as useful to a mechanic as to an electrician, or to a gunsmith. There are so many different kinds of tools which could be considered essential to the backwoods home that it's sometimes hard to know where to begin and where to end. But there are certain basic tools that perhaps every household should have, and covering those will be the main focus of this article.

At the top of the list we might include those tools with which we could most easily produce other tools. It used to be common to see old anvils and coal forges around farm houses and in barns. They were used for a lot of different purposes besides making horseshoes. On the anvil, a



*Multi-function tools are valued for their excellent versatility.*

variety of knives, axes, chisels, punches, brackets, hinges, and every imaginable type of farm implement could be shaped or repaired. Basic blacksmithing tools can be extremely useful in a rural environment. Although often overlooked in this day and age, I would place the forge, anvil, hammer, tongs, and other hot metal working tools at the top of the list for the backwoods home.

Second on our list we might include the multi-function tools popular now. These would include the plier-type combination tools from Leatherman, Gerber, SOG, and Buck, as well as the Swiss Army Knives from Wenger or Victorinox. Although somewhat limited by size, these tools combine a list of capabilities into a single device, making them quite versatile and useful for small jobs. With the Leatherman SuperTool, you can slice, carve, scrape, saw, remove bottle caps, dig, file, crimp, and grip, among other things. It's a wonderful product in my opinion, and certainly something I would choose over a number of bulkier single-function tools whenever forced to prioritize.

Before leaving the topic of multi-function tools, I should also mention the basic fence pliers that have been around for many years in one style or another. Most of these have a ham-

merhead opposite a pointed horn for pulling large staples, and the tool can be used as pliers, hammer, staple puller, and wire cutter. It's a four-in-one combination tool, and it is hard to imagine a farm without one or more of these around.

Most people would probably put some type of knife at the top of the list. This makes sense because knives have hundreds of different uses. A knife would be at the top of my list whenever the tools to produce a knife aren't practical, such as wherever

space and weight limitations dictate. But I would agree with those who believe that a knife is a basic item that belongs in every category.

Drills and drill bits should be high on the list. Drilling holes in things is one of the most important tasks common to several categories. I use my own drill press as much as I use any tool in my shop.

Another commonly overlooked category of tools with really a fundamental purpose is the thread-cutting taps and dies category. You won't find



*Everything here was purchased at garage sales for around \$100. That wouldn't buy much at new prices. You can make money go a long way if you buy used.*



these in every toolbox, or even in the majority of American homes, but wise do-it-yourselfers keep a few of the common taps and dies in their shops. With them a person can make their own screws, nuts, and bolts. It can be inconvenient having to run into town every time you need some tiny machine screw with a special

thread size because you can't find one in your screw bin. Some are hard to find anyway, possibly not even available at the local hardware store. It is extremely handy to be able to cut your own as needed.

We can continue adding the usual hand tools—hammers, saws, pliers, screwdrivers, clamps, vises, wrench-

es, files, rasps, squares, tape measures, levels, pry bars, etc.—and assemble a comprehensive list of basic items until we're confident that we could tackle most jobs around the ranch. And of course, there's no telling where all this will take you.

It's probably a good idea to focus on basic hand tools first and add power tools last. For one thing, power tools require more care and understanding to safely operate. They tend to wear out faster than simpler hand tools, and they cost more. And out in the country you may not always have electricity available. You can always accomplish a great deal with basic hand tools, just as your great grandparents did years ago.

Quality tools can be expensive, but the good news is that amazing bargains are to be found almost everywhere. Thrift stores, pawn shops, flea markets, and garage sales often sell good used tools unbelievably cheap. Sometimes they need cleaning, or they may even need to be repaired or sharpened in some cases, but most of the things I've found could be restored to service with little or no additional investment. It's always a good idea to look for quality. American made or European tools are usually worthwhile, but I tend to avoid products from China or Taiwan. The more tools you collect, the better you'll be able to fix and restore the broken ones.

There's nothing quite like a good tool shop for dealing with so many of the chores around the house. If you don't already have a shop set up at your country home, now is a good time to get started. If you are set up already, I hope I've got you thinking about how to make it even better. Δ

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# The return of home emergency shelters takes on a dual-purpose approach

By Jeffrey R. Yago, P. E., CEM

**A**fter September 11, 2001, all of us became much more concerned with protecting our families from biological, nuclear, and terrorist attacks. However, if you followed up by trying to learn more about civil defense in the United States you soon found out the dirty little secret—there isn't a national civil defense program in the United States today.

After our National Civil Defense Program died a quiet death in the 1970s, the Federal Emergency Management Agency (FEMA) took its place, but with an entirely different set of goals. FEMA is not in the business of promoting self-preservation or shelter construction. Our government has taken the position that it would be impossible to construct enough government-funded shelters to protect all United States citizens, and even if it did there is the belief that most of these shelters could not provide enough protection and would not be properly maintained.

It is the public's attitude that survival preparation is somehow a waste of time because life would not be worth living after a nuclear attack. This is not only untrue, but borders on a premeditated form of national suicide. This is not the attitude of most other governments. Their view is that with minimum civil defense training and some basic advance preparation, most people can survive almost any calamity, including a nuclear attack, and go on to rebuild a new life.

## A fatalistic federal response

FEMA views its role as a facilitator of emergency response *after* a natural catastrophe has happened. Many feel there is nothing that can be done to protect our large population in advance of an unknown threat, so better to organize for handling mass



*Family size underground survival shelter (Courtesy of Utah Shelter Systems)*

casualties and mass evacuation after it happens. Although our government does not currently promote any form of self-protection for its citizens, it does provide well-supplied underground shelters for "critical" Federal government employees and elected officials. As of this writing, there is no Federal agency providing shelter designs that have been tested and approved. Most of the shelter designs available are reprints from testing that was done as part of atomic bomb testing during the early 1950s, and they do not reflect the more advanced construction materials and survival equipment available today.

To fill this lack of up-to-date information at the Federal level, the Internet has become the primary source of design and product infor-

mation related to emergency shelter construction. But how is the average homeowner going to know what designs work best and what should be done since there isn't a "government seal of approval" technical review or standardized rating system?

Also now missing, but originally included in the Federal civil defense program, is civilian training. Just what would you do if you actually heard an emergency warning? Should you go to the lowest point, highest point, jump in the car and evacuate, lay down in a ditch, put on a gas mask, get under a doorway, or stay where you are? Each of these answers could be right or wrong depending on the threat, but without any training or guidance most citizens will just follow the herd—even if it's over the cliff.

The starting point for taking control of your own protection starts with identifying what are the most likely threats you face, and what type of shelter will offer the best protection from these threats.

## Types of shelters

There are many potential life threatening events facing a typical family today. Depending on where you live, some threats are more likely than others, but in almost all cases there is an emergency shelter design that can reduce your risks and lesson your discomfort. Before going into more specific details on shelter designs, let us first review the many uses for a shelter and the different types of shelters that can be built.





*Prefabricated safe room  
(Courtesy F-5 Storm Shelters)*

An underground storm-type shelter could protect your family from weather related threats including tornadoes and hurricanes. A well-stocked basement with emergency lighting and heat could provide comfort during an extended power outage or snowstorm. A fireproof type shelter could provide life saving protection for family members in the event of a fast moving forest fire or home fire. A bulletproof type shelter hidden in a bedroom closet can save the lives of family members during break-ins by lawless vandals.

Many homeowners are now installing bulletproof safe rooms inside existing homes. These shelters are usually prefabricated metal enclosures with heavy metal doors, and they are designed to fit inside a bedroom closet or add-on room. These shelters are primarily for temporary personal protection from intruders or vandals, and are not intended to provide protection from radiation or biological type threats.

If you live near a nuclear power plant or military target, a fallout type shelter could improve your chance of surviving a biological or nuclear attack or accident. Most people today believe it is not possible or desirable to survive a nuclear explosion. However, unless you are located near the point of the actual impact, it is fairly easy to survive the blast by knowing what to do and seeking the safety of a properly designed fallout shelter. The greatest danger from a nuclear explosion comes in the form of radioactive vaporized dirt that is sucked up into the sky and soon starts to fall back to earth and cover the ground like a deep snow. Most of this material will lose most of its life threatening radioactivity in as little as two weeks. It is not unrealistic for a family to live comfortably inside a properly furnished shelter for this brief period until the exterior radiation levels reach safe limits.

## Dual use shelter

Many people consider installing an emergency shelter a waste of space and money, especially if it is never used, but what if it has another function? What if your emergency shelter is also that big food pantry you always wanted, or a cool wine cellar, or a hobby room? In other words, the shelter function is in the design, but this will not necessarily interfere with the everyday use for this room or space. The following shelter selection guidelines will provide a good place to start.

## Basic shelter guidelines

If you have viewed pictures of the flat concrete slabs remaining after a tornado or hurricane with the rest of the house missing, you will see why a storm shelter will probably need to be underground to provide suitable protection from high winds. If located within a house, the shelter should be constructed of strong nonflammable building materials like steel rein-

forced block and concrete. Since flooding can accompany many storms, the danger of high water needs to be considered when designing a below grade storm shelter. Basements can be used for some types of shelters, but they should not rely on the wood floor above for a secure roof. A basement shelter should have its own concrete roof just below the wood framing above.

If you want protection from radiation, you will need at least 12 inches of concrete to provide even a basic level of radiation shielding. If this is not practical for your basement, a 24 to 36-inch layer of sandbags will pro-



*6'x6'x10' steel tornado shelter  
prior to backfill  
(Courtesy of F-5 Storm Shelter)*

vide a suitable substitute, and be much cheaper to build. Any shelter should provide a minimum of 20 square feet of floor area per occupant. Most underground radiation shelters have at least three feet of earth cover, and use an entry having one or more 90-degree turns to block radiation which travels in a straight line.

Many do-it-yourself type underground shelters can be made from large diameter galvanized corrugated steel culverts or concrete storm pipe, or fabricated rectangular steel tubes in 10 to 40-foot lengths. Some people are even burying metal containerized cargo trailers to make their own low cost shelters. Although these have very strong corners to allow stacking several high, their thin metal sides and roofs are weak and require extensive reinforcement to prevent buck-

ling when backfilled. Several manufacturers now offer fully assembled steel and fiberglass underground shelters that can be shipped by trailer to the site and buried, leaving only an access door and vent pipe exposed above ground.

Site-built underground shelters usually follow the same construction techniques used to build home basements, but roof span widths should be minimized due to the extremely heavy column loading for an earth covered concrete roof deck. The potential for moisture condensation on cool interior shelter walls and ceilings, and a higher potential for water leaks must be addressed in any underground structure. Many shelters will use the same type of exterior wall waterproofing and interior wall damp-proofing as used to protect basements in areas having a high water table.

A shelter should have a fire resistant and gasketed hatch or door. Although a custom-made door and door frame fabricated from heavy-gauge steel is usually required to resist high-pressure shock waves from a nuclear blast, a more practical solution for non-nuclear shelters may be a commercial metal fire rated exterior door sold by building supply outlets. Be sure to include a good fire-proof gasket seal around the sides, top, and bottom of any exterior hatch or door, and locate all doors to minimize the potential for egress blockage. Mounting a door that swings out increases the perimeter frame resistance to high pressures, but also increases the risk of being blocked in by wind-blown refuse. Multiple dead bolt locks should be added since a residential style lock will not hold. One of the biggest problems with the underground tornado shelters common across many western states is insect infestation. Without good door seals and insert screening on all vents, you may find that your shelter

is already occupied when you really need it.

If your shelter is intended to provide survival protection for weeks, not hours, you will need to think about interior ventilation, emergency lighting, sanitation needs, and basic food, medical, and water supplies. Since any event serious enough to require the use of a shelter will almost always include the loss of utilities, you should have several low energy battery powered lights and a battery powered exhaust fan. The January/February issue of this magazine (Issue No. 73) included an article describing how to make a solar powered lighting system that will easily meet all shelter lighting needs.

## Shelter ventilation

Outside air ventilation is a very critical requirement for all shelters. Any extended use of a sealed shelter will require constant air changes. There have been numerous medical problems related to fallout shelters that were traced to stale air, not radiation poisoning. Older Department of Defense shelter design guidelines recommended 4 cubic feet per minute (CFM) of outside air ventilation per shelter occupant, but most shelter designers today feel this is the threshold for carbon dioxide sickness and much higher ventilation rates are needed. Since outside ventilation air is also necessary to reduce high humidity levels and overheating in any confined area, a more realistic value of 10 CFM per person in colder climates and 30 to 40 CFM per person in hotter climates is more realistic.

Several manufacturers offer a rotary hand operated blower designed to ventilate underground shelters continuously, but these can be ineffective in larger shelters due to their low flow rates and the need for manual cranking 24 hours per day. There are several homemade manual ventilator designs similar to the old blacksmith



*Corrugated steel pipe shelter ready to bury. Note substantial waterproofing. (Courtesy of Utah Shelter Systems)*

forge bellows available on the Internet.

All shelter air intakes, exhaust vents, and piping should include a manual internal shut-off valve or gate. You should also understand that a typical tornado or hurricane can tear off or bend over all pipes and vents sticking up out of the ground or through a concrete floor slab. Locate all vents to minimize the potential for wind damage and provide good structural support. Wind speeds and air pressures related to a nuclear explosion can be multiple times higher than the most severe hurricane. A turned-down steel pipe intake vent will minimize the risk of vandalism or rainwater flooding a below grade shelter. In general, a properly designed air intake will keep air velocities low to avoid pulling in any falling radioactive dust particles. Air intakes should be turned-down steel pipes located high enough above any radioactive dust that has settled out and covered the ground.

A combination HEPA filter and an activated charcoal filter are needed to make ventilation air totally safe from biological and radioactive contaminants. All outside air intake and exhaust vents should be manually closed off during the initial threat of any attack, then reopened when the threat is reduced. Many of the automatic spring loaded blast valves manufactured to protect the external



openings of military shelters will no longer operate when required after providing a home for birds, rodents, and insects for years.

## Shelter sanitation

A conventional commode may not have a domestic water supply for flushing after a major catastrophe or may be located below the existing sewer line, but there are two types of low cost sanitation systems that will work with most underground shelters. The commode seat and disposable bag system sold for camping trips can meet short-term sanitation needs for one or two shelter occupants. For longer shelter stays, several manufacturers offer a self-contained waterless composting toilet. Using a manually rotated drum containing a biodegradable material, all wastes are converted to safe composting material, and any remaining liquids are converted to drainable non-potable water. Due to a higher risk of illness during longer shelter stays, you should also have several sizes of plastic trash bags for other biological and medical waste storage.

After major floods, hurricanes, and tornadoes there is always a major fly infestation due to thousands of animal carcasses that may remain out in the open for weeks. Since using insect sprays in a confined air space can be a ventilation air problem, quality insect screening on all openings is critical.

## Shelter food and water needs

There are many books available that describe emergency food and water supplies. This magazine's big anthologies are filled with such information. All shelters should include at least a basic quantity of food, medications, and drinking water for all occupants for up to two weeks. FEMA recommends a minimum of one-gallon of water per person per day. Keep in mind that all emergency



*Composting toilet (Courtesy of Sun-Mar Corporation)*

food and water supplies have a limited shelf life and should be rotated every six months. Pre-packaged dehydrated survival foods are available that require minimum storage space and have a shelf life of several years. If your dual use shelter will be used as a pantry, be sure to also store foods that can be eaten without cooking or further preparation. You will also need disposable eating utensils, paper plates, and garbage bags.

## Shelter furnishings

Since your dual-use shelter will be used for its alternate purpose throughout most of its useful life, you will want to minimize the floor space required for "shelter only" items. Although you can sit on the floor for a few hours during a serious storm, you will want a comfortable place to sleep and sit for extended shelter stays. Most camping supply stores offer excellent cots, sleeping bags, camp chairs, and tables that fold up into easy to store bags. A reinforced plywood bed foundation can fold completely up against a wall or be used as a table during the day. You can stack beds up to three high along each wall for higher occupancy needs or use hanging rope hammocks. Do not forget to include books to read, a quality battery powered radio, several flashlights, and extra batteries.

## Shelter medical issues

When a shelter is only used to wait out a fast moving storm, there will be little need to store food and medical supplies. However, events that require a shelter stay of several days can increase the risk for medical conditions that most people do not normally deal with. When several people are confined together in a small windowless enclosure that has minimum fresh air, no sunlight, higher than normal temperatures and humidities, little or no bathing or personal hygiene, and a major change in daily diet, there will be a much higher risk for headaches, diarrhea, skin rashes, fungus infections, and insect bites. Fortunately, there is an endless choice of low cost over-the-counter medications to treat each of these problems. Any extended-stay shelter should include these basic medical supplies, along with personal hygiene and eye, ear, tooth and hair care products. A good supply of waterless wipes, skin lotions, toilet tissue, paper towels, Vaseline, no-pest strips, disinfectant, Clorox, bacteriological soap, disposable medical gloves, water purification tablets, canned heat, matches, and several face cloths will also make confined life much easier. Again, this magazine's anthologies have articles addressing emergency medical kits.

Shelters can be above ground, below ground, or installed in existing basements or closets. Shelters can be homemade or purchased premanufactured. A single shelter can be large enough to protect an entire retirement community or just a single person safe room. All shelters can serve multiple purposes to make them more cost effective and to provide extra space during non-emergencies. It is hoped this introduction will allow you an opportunity to review your own shelter needs. For more detailed shelter design and construction information, please refer to the following texts and web sites.

## Resources

### Shelter design and survival books:

- *Principles of Protection—U. S. Handbook of Shelter Engineering Design Standards—5th Edition*, by Walton McCarthy
- *Making the Best of the Basics* by James Stevens
- *No Such Thing as Doomsday* by Philip Hoog
- *How to Implement a High Security Shelter in the Home* by Joel Skovsen
- *Nuclear War Survival Skills* by Cresson Kearny
- *Fallout Shelter Design Collection (Second Edition)* by FEMA
- *Emergency Preparedness and Survival Guide* by Backwoods Home Magazine (See ad on page 19.)
- All of the *Backwoods Home Magazine* anthologies (See ad on page 91.)

### Nongovernment civil defense groups:

- *Survival Ring Newsletter* by Richard Fleetwood, [www.survival-ring.org](http://www.survival-ring.org)
- *The American Civil Defense Association (TACDA)*, [www.tacda.org](http://www.tacda.org)
- *Dominion Group Survival Preparedness*, [www.cpn.freeyellow.com](http://www.cpn.freeyellow.com)

### Shelter-related websites:

- Underground shelter resources and survival database, [www.earth-mountain.com](http://www.earth-mountain.com)
- Solar and battery powered lighting systems for shelters, [www.dunimis.com](http://www.dunimis.com)
- How to build a bomb shelter, [www.plansfordummies.com](http://www.plansfordummies.com)
- Permanent family size fallout shelters, [www.oism.org/nwss](http://www.oism.org/nwss)
- Shelter composting toilets, [www.sun-mar.com](http://www.sun-mar.com)

### Pre-built shelter manufacturers:

- Fiberglass underground radiation shelters, Radius Defense and Engineering, Inc., 603-942-5040, [www.undergroundshelters.com](http://www.undergroundshelters.com)
- Underground storm shelters, Blue Sky Contracting, [www.groundsafe.com](http://www.groundsafe.com)
- Underground corrugated pipe shelters, Utah Shelter Systems, 435-657-2641, [www.disastershelters.net](http://www.disastershelters.net)
- Underground and above ground fabricated steel shelters, F-5 Storm Shelters, 318-248-2994, [www.f-5stormshelters.com](http://www.f-5stormshelters.com)

(Jeffrey Yago is a professional engineer and author of the book, *Achieving Energy Independence—One Step at a Time*, which is available on line at [www.pvforyou.com](http://www.pvforyou.com) or by calling 804-784-0063. It is also available in this magazine's book section.) Δ

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# Raised bed gardening —neat and productive

By Alice Brantley Yeager  
Photos by James O. Yeager

**A**re you tired of raising a big row crop garden—one that keeps you busy from dawn until dusk? Do you really need to raise enough vegetables to feed Cox's army? At the end of the gardening season, are your freezer and pantry so well stocked that they are overstocked? If your answer is "Yes" to these questions, you might like to consider changing from row crop to raised bed gardening.

With raised bed gardening we avid gardeners can still enjoy harvesting plenty of fresh produce, but on a smaller scale than with a row crop garden. As we grow older and less inclined to take on the challenges of a large garden, we all begin to cast about for an easier way to do things. For that matter, it's not always the elderly who want smaller gardens.

Younger gardeners with families to rear and pressed for time to devote to family outings and Little League Baseball may benefit from a close-to-home project—i.e., raised bed gardening. Children introduced to gardening at an early age learn patience, responsibility, and the value of growing nutritious food. A good way to begin teaching them is to give each child a raised bed of his/her own. Some may want to grow flowers and vegetables and others may lean toward raising only their favorite vegetables. Whatever the choice, be supportive all the while passing along bits of information about the soil, when to plant or transplant, use of compost, when to water, etc.

Highlight meals with something from a child's own raised bed.

Converting from rows to raised beds may be done gradually. Nowhere is it written that this has to be done all at once or that it has to be done at any particular time of year.

Fall is probably the most practical season to begin the changeover, as that is the time to clear the garden of old plants, pull down vine supports and generally tidy up the place. With a clean garden, one can measure and decide just how many raised beds are



*Our raised beds produce an ample harvest and make it possible to keep our garden in a neater fashion than when we had the garden in row crop style. We still rotate plants each year just as we did with the rows.*



desirable, space needed between beds, and so forth.

Our raised beds are 4 x 8 feet in size as this is a comfortable working size for us. This allows for two rows of large plants such as peppers and tomatoes. Lower growing plants—turnips, bush beans, beets—may be planted closer together making three rows per bed. We generally broadcast (scatter) seeds of lettuce, radishes, and mustard. The rectangular beds are lined up compass fashion—short sides toward north and south and long sides facing east and west. There is no set size for raised beds. You may prefer square beds or long narrow beds depending on space available. Just remember to construct them to suit your needs.

Tall growing vines (pole beans, cucumbers, etc.) are usually planted in a row along the west side of our beds so they will give some shade relief to shorter plants on the east side of the beds during hot summers.

Climbing plants may also be planted A-frame fashion in the beds, leaving the ends open so one may easily slip in and harvest from the middle if desired. We prefer a straight line of hog wire secured by a post at each end and one in the middle. (We went to the stout support when we had trouble with bean vines blowing over during windstorms. There's nothing like trying to straighten up heavy, snarled bean vines!)

When laying out the raised bed plans, allow plenty of room to use a mower between the beds if you are not going to put down bark or some other type of weed inhibitor. If you have a garden cart or other garden aid, you will want to have room enough to maneuver it easily. All of us need space to use kneeler/seats (you can get them from Pinetree Garden Seeds) or some type of low bench when we sit in the aisles to weed or cultivate.

We have used landscape timbers to outline our beds. Timbers are available at most large garden suppliers or lumberyards and come in 8-foot lengths. Cutting one in half gives the necessary 4-foot ends for a bed. (See illustration.) If landscape timbers are not available, there are lots of other materials to use—concrete blocks, bricks, old fence posts, etc.—just so long as the material is compatible with the soil. You wouldn't want to use something like newly creosoted railroad ties that would contaminate the soil. Old railroad ties that have had the creosote leached from them by long-time use are all right and will last for years.

Avoid making the sides of the beds so high and tight that you create a water trap. Everyone's garden is a little different. Some are on slopes. Some are level. Some have boggy spots. Whatever the situation, the basics necessary for a successful garden still apply—good drainage, plen-



*A raised bed of spring lettuce and radishes will produce all that we can use and still have some left for friends.*





*There's nothing better than fresh potatoes, and a sizable quantity can be had from a 4 x 8 foot raised bed.*

ty of sunshine, fertile soil, and water when necessary.

Raised beds are a dandy way to keep compost where it's needed, as they prevent good soil from sliding away. If you want to let some beds lie idle during the gardening season, you can dump your organic gleanings in them and let nature take its course. Grass clippings, spent plants, wilted flowers, kitchen scraps (no grease or meat) will decompose just as they would in a compost pile. However, don't dump any diseased plants or weeds loaded with seeds, as these can come back to haunt you later.

I can guarantee plenty of earthworms will show up to till the soil and give it the benefit of their castings. When you are ready to dig the decomposing matter into the soil and use the fallow beds, you will find that

the soil is loose and easy to work with a garden spade or fork. While watering the rest of your garden during dry spells, don't forget to give the fallow beds some water to keep them reasonably moist. Dried-out leaves, etc., don't turn into compost very quickly and earthworms will die out or seek a better home if moisture is absent.

We let grass and white clover grow between our beds, thus eliminating the dust or mud we experienced underfoot when our garden was in rows. Low growing herbs such as pennyroyal (perennial, available from Pinetree Garden Seeds, Box 300, New Gloucester, ME 04260) spread out here and there in the aisles give off a delightful scent when stepped upon. With vegetation between the beds, the garden seems cooler during

hot weather and we walk on a soft carpet.

Soil building is an important part of any garden and it's much easier to control that aspect of gardening with raised beds. The constant adding of organic matter, whether it is compost or mulch, assures a continued supply of nutrients to the beds. The mulch used in summer to conserve moisture breaks down to form humus just as grass clippings, leaves, etc., decompose in a compost pile. I am often amazed at the loose, friable condition of our soil after a summer of mulching.

Even with the soil looking great, there is the possibility of the pH scale being out of balance. Briefly, pH is the measure of acidity or alkalinity of any substance, and where gardens are concerned pH is very important. The

pH scale runs from 0 to 14. The greatest degree of acidity is 0, 7 is neutral, and 14 indicates the greatest degree of alkalinity. Most vegetable plants grow well in a soil that has a pH of 6.0-8.0. Lima beans prefer pH 5.5-6.5 and potatoes 4.8-6.5 making them slightly more acid loving. If you are uncertain as to the pH of your soil and you suspect the pH could be a little off one way or the other, it would be well to contact your county extension agent regarding a soil test. You may need to add a little lime to raise the pH or you may need to add sulfur to bring it down to neutral.

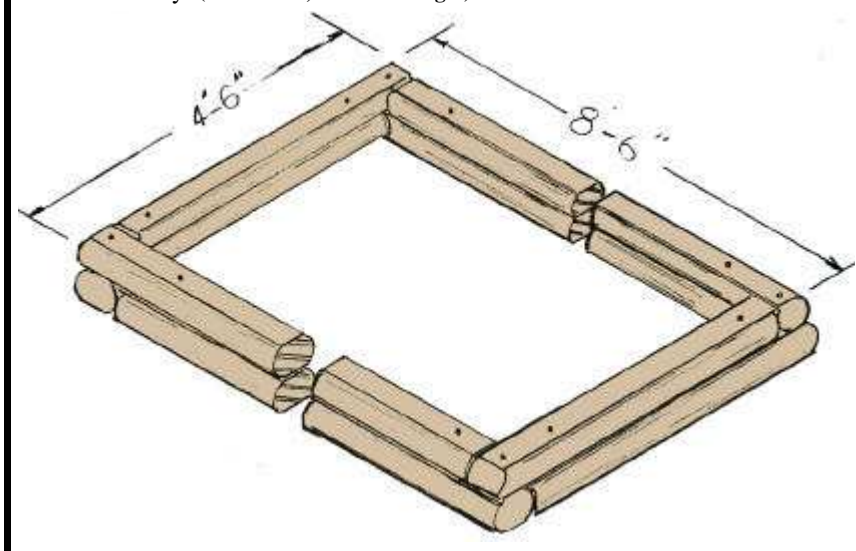
When ready to put in transplants, remember that plants are going to require about the same room as when grown in rows. In other words, don't try to squeeze more sweet pepper plants into the beds than normal spacing would allow. Consider whether the pepper plants are tall growing or compact and bushy. Spacing can range from 10-15 inches apart depending on the varieties. Hot peppers also come in a variety of sizes from tall to short ornamental types. We use tomato cages as supports for all pepper plants, unless they are short growing and need no support. We place the cages over the young plants as soon as they are transplanted. Cages also serve as protection against prowling animals.

Tomato plants mature to different heights, too. Barring disease or disaster, tall vining or indeterminate varieties will continue to grow and produce until frost takes its toll. These varieties need plenty of spacing between plants, but it is still possible to have two rows of plants in the same bed OR to have a row of tomatoes on the west side of the bed and shorter plants on the east side.

Indeterminate tomatoes need tall, stout supports. We have a supply of tall cages made from reinforcing wire and, when necessary, we use bamboo canes horizontally between them. Tomato plants will often develop side

## Raised bed construction

We use landscape timbers around our raised beds. The depth of two horizontal timbers works for us, but some folks might only want one and others might even go to three. As time goes on, soil will build up around the bottom layer. Timbers are about 4 inches in diameter and we use 6-inch nails to keep them stationary. (Illustration, James O. Yeager)



shoots or suckers and become bushy. Each of these side shoots will bear flowers and fruit and, if left on the plants, they will require more and more of the plant's energy resulting in smaller tomatoes or none at all. In our area plants need plenty of foliage to protect fruit from sun damage, but good ventilation between plants is also necessary. Therefore we clip out a number of suckers keeping in mind that plants still need to retain enough foliage to shade their fruit. Indeterminate plants growing in raised beds present a neat appearance when pruned and are easily accessible from all sides for mulching and weeding.

Determinate (fixed height) tomato plants usually give a good return, but due to their growth habit, once their fruit is set, that's it. The tomatoes ripen, are harvested, and the vines produce little, if any, tomatoes after that. Our favorite determinate is Celebrity. It has good disease resistance and gives us an ample harvest. Being smaller plants than indeterminates, we can plant a couple more

plants per bed and we can stake the plants with medium height tomato cages. After the spent plants are removed, we let the bed lie fallow until we put in a fall crop of greens or onions.

Almost all southern gardens will have okra in them. Okra's large shady leaves rule out planting anything else in the bed, so we devote a bed to a dwarf type okra such as Lee (Park Seed, 1 Parkton Ave., Greenwood, SC 29647-0001). We can have two rows of Lee plants spaced about 15 inches apart and staggered. Tall growing Clemson Spineless okra would be limited to about four or five plants per bed. Lee gives a prolific harvest—plenty of pods to enjoy fresh and plenty to put in the freezer.

We don't try to grow large rambling plants—pumpkins, cushaws, etc., as it's easier to buy the one fruit we'll probably use than take up needed space to grow it. However, bush varieties have been developed that take up less space, so we may have the pleasure of trying some of those at a later date. Sweet potatoes need room

to spread out, so they're a no-no. However, a nice amount of Irish potatoes may easily be grown in a raised bed and the bed used for something else after the potatoes are dug.

As with almost any summer season there will be times when you wonder if you'll ever see rain again. Beds have been well mulched, but plants look like they could benefit from a good soil soaking. It's well to give Nature a hand by scheduling a watering pattern—maybe twice per week or more often when the weather becomes downright hot and miserable. Raised bed gardening is a great way to conserve water, as the water put in the beds stays there and soaks in. We have a small inexpensive sprinkler that we turn on low pressure and place in our beds while we're harvesting or working in the garden. This allows for a good soaking with no run-off and we don't have to hover with hose in hand.

A fringe benefit of raised bed gardening is the amount of tools needed. No longer are garden tractors, tillers, and other large pieces of gardening equipment necessary. Once you have the soil in your beds in good humusy shape, you can get along with a spade, fork, and some small hand tools. Again, you will be the judge as to which tools work best for you.

We don't use chemical fertilizers as that is one sure way to eliminate the earthworm and kill out beneficial microorganisms. Some gardeners have actually damaged their soil by the use of too many concentrated chemical fertilizers. Restoring the soil to good condition may take years. We have found compost and mulch seem to work best in our raised beds. After all, Mother Nature has been piling on the humus for a long time and it works for her. Just witness some of her prize-winning displays! Δ

## Raised beds, concrete blocks, and clay soil

*By John Dunbar*

Raised-bed gardens have many advantages over conventional ones. They give the greatest benefits when your underlying soil conditions are not ideal. In our area near Gulf Coast Texas we have heavy clay soils that are not easily prepared for vegetable gardens. Our raised beds enable us to garden intensively using custom-made soils.

There are several ways to build raised-bed gardens and they all work well. But I believe some work much better than others. My wife and I have built five of our seven raised-bed vegetable gardens using concrete blocks. We are very satisfied with their performance.

While untreated planks are known to deteriorate within just three years, and pressure-treated wood planks can contain dangerous chemicals, concrete blocks will last nearly forever and do not react with moist soil. Plus, all the materials can be easily purchased at any building supply store, or scavenged at construction sites. The costs for one wall range from 80 cents per linear foot up to \$1.50 per linear foot. A 20-foot long garden might require \$50 in concrete blocks.

To construct, first build the outline of your garden bed, aligning the blocks with stakes, strings, and a carpenter's level if you want it to look more professional. Then put down layers of 10 to 20 sheets of newspaper to block out weeds and grass. On top of the newspapers pile the best soil you can find. You can use either 8 x 8 x 8-inch solid concrete blocks, which are heavy enough to stay in place yet sized small enough for most people to carry, or standard-sized concrete blocks used in house construction. The latter measure 8 x 8 x 16 inches and are easy for most people to grasp and carry.

The standard-sized blocks are inexpensive and surplus ones might be found at most construction sites. On top of these blocks I put a 4 x 8 x 16 inch solid block turned on its side. This covers the hollow spots and raises the bed another four inches.

The recommended width of normal raised bed gardens is about 4 feet. If you want to have a spot to step on you can use a 1 x 8 x 16-inch block broken in half to provide a nice stepping stone. Having a two-wheeled dolly with fat tires helps when transporting these concrete blocks without sinking into the ground. I also use a block hammer to split blocks if required. Δ

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## Continued from page 29

tries, whole armies could be destroyed without destroying the countryside in the process. From the war protesters' point of view, they were weapons of greedy capitalists who wanted to kill people while leaving property undamaged. From the military perspective they were weapons that would kill invading armies while not desolating the entire countryside. People who fled their towns could go home and find much of the infrastructure intact.

## How an atomic bomb works

The amount of fissile material ( $U^{235}$  or  $Pu^{239}$ ) typically used to make fission weapons with the yield that destroyed Hiroshima and Nagasaki (about 13 kilotons of TNT) runs from about 6 to 15 pounds of  $Pu^{239}$  in a plutonium bomb to about 40 pounds of  $U^{235}$  for the uranium bomb. (The  $U^{235}$  bomb dropped on Hiroshima required 130 pounds, but that may be because it was the first uranium bomb and therefore more primitive.)

The difference in the amount of fissile material between the  $Pu^{239}$  and the  $U^{235}$  bombs is because, though the uranium bomb is much easier to set off, uranium is not as efficient at undergoing a chain reaction when it explodes and a great deal of it goes to waste. Approximately as much material undergoes fission in the uranium bomb as in the plutonium bomb, i.e., about 10 pounds, but the rest is just vaporized by the explosion.

This is one of the reasons that "Little Boy," the uranium bomb we dropped on Hiroshima, is, as far as I know, the only uranium bomb this country ever made. All of our other nuclear bombs, whether tactical atomic bombs or the detonators for

## Nuclear fission

There are two ways  $U^{235}$  or  $Pu^{239}$  can decay. One is by the emission of alpha particles from the nucleus (alpha particles are the same as the nucleus of a helium atom that has been stripped of its two orbiting electrons). What's left behind are other radioactive atoms—protactinium in the case of  $U^{235}$ ,  $U^{235}$  in the case of  $Pu^{239}$ —and, once the alpha particle acquires two electrons, there's also a helium atom that didn't exist before.

The other way  $U^{235}$  and  $Pu^{239}$  can decay is that, on rare occasions, spontaneous *fission* that naturally takes place (the same kind of fission that takes place in an atomic explosion) results in two much smaller atomic nuclei, a *substantial amount* of energy, and two or three free neutrons.

It is this second kind of decay that starts a chain reaction in a fission bomb. In  $U^{235}$  if any of those extra neutrons that are produced are absorbed by a neighboring atom of  $U^{235}$ , that atom becomes unstable and it undergoes fission and also releases a substantial amount of energy while leaving behind two smaller atoms and two or three extra neutrons. And, if those neutrons are further captured by more  $U^{235}$  nuclei...well, you get the picture. More and more neutrons are produced and captured by more and more  $U^{235}$  nuclei and this is a chain reaction. First hundreds, then thou-

sands, then millions, then billions, then trillions of nuclei are involved in the reaction, all releasing ever more neutrons and a *huge* amount of energy. And it all happens in a few millionths of a second. A similar but slightly more difficult process must occur to get  $Pu^{239}$  to undergo fission.

But, in either case, four conditions must be met:

- 1) There must be enough of the  $U^{235}$  or  $Pu^{239}$  atoms to sustain the reaction.
- 2) The atoms must be close enough together.
- 3) There can't be too many impurities that can absorb the free neutrons and stop the reaction.
- 4) The neutrons can't be too fast. (When the nucleus undergoes fission it isn't "exploding" like a pumpkin does when a rifle bullet goes through it. The neutron just goes right through it leaving it more or less undisturbed. The neutron must move slow enough to be "captured" by the nucleus. Then it is more like the "straw that breaks the camel's back" because the extra neutron makes the nucleus unstable and it splits.)

If there aren't enough neighboring  $U^{235}$  atoms or they're too far away, the neutrons are lost and the "chain reaction" can't be sustained.

hydrogen bombs, have been made from plutonium.

But despite the 6 to 15-pound limit I just gave, smaller bombs are possible. A recent report from the Natural Resources Defense Council states that nuclear weapons with a destructive power of 1 kiloton can be built with not much more than 2 pounds of weapon-grade  $Pu^{239}$ , while the smallest amount of  $Pu^{239}$  that could be used to achieve critical mass (actually

critical density) is about a half a pound.

A bomb using half a pound of  $Pu^{239}$  would, naturally, have a yield of less than a kiloton. But the problems of achieving critical density is even more acute with such a small mass and not likely one to be solved by terrorists. It has, however, been solved by scientists in the U.S. and Russia. And that is a problem for us because, as we shall see, there are rumors that very small attaché case-size bombs



are missing from the Russian inventory.

## The effects of a nuclear detonation

The destructive effects of nuclear explosions are thermal (as in fire), blast, electromagnetic pulse (EMP), and radioactive fallout.

**Thermal effects.** When a nuclear bomb goes off there is an immediate pulse of x-rays. These x-rays superheat the surrounding air to white hot temperatures. This superheating of the air is the start of the *fireball*. It is also the source of a burst of light and heat that will blind, burn, and cause spontaneous fires. Both the x-rays and the heat will kill. This will all happen in less than one second. Most of the deaths from a nuclear explosion will happen in this first second.

**The shock wave.** The violent expansion of the superheated air also produces a shock wave—or pressure wave—that radiates out from the fireball at supersonic speeds. The overpressure of this wave knocks buildings down, and throws bodies, automobiles, trucks, and even trains through the air. Many of the deaths and injuries will result from flying debris caused by the shock wave.

And besides the spontaneous fires caused by the searing heat of the initial explosion, more fires yet will be caused by buildings that collapse as the pressure wave passes over them. The source of these secondary fires will be electrical and gas fires caused by buildings that collapse, from utilities that fail, gas stations that are destroyed, and automobiles, trucks, and even gasoline hauling tanker-trucks that are tossed through the air.

The shock wave or overpressure wave will also generate winds whose velocity will depend on the size of the blast and your distance from it. At the very least there will be hurricane-force winds. With a large thermonuclear bomb the winds near the blast

will be several hundred miles per hour.

In both Hiroshima and Nagasaki winds as far away as a mile from the center of the blast threw masonry walls as much as 80 feet. If stone walls were tossed about by the winds, it's likely that people were too and the probability of surviving being thrown about in this way is slight.

As to effects of blast pressure on the human body: the human body is remarkably resilient and resistant to just the increase in pressure alone. It's thought that at both Hiroshima and Nagasaki that the people who may have been killed by the pressure increase alone would have had to have been within a few hundred feet of the explosion, and they would have been killed by gamma radiation, heat, flying objects, and being thrown by the winds, anyway.

**Radiation.** In both Hiroshima and Nagasaki there were immediate injuries and deaths from radiation. They were from the ionizing radiation immediately created by the bombs in the first few seconds of the blasts.

For those exposed to the most intense blast of radiation, death was probably 100 percent certain. To lesser degrees this radiation resulted in injuries and illnesses that resulted in varying degrees of temporary hair loss, bleeding—both internal and external—and various other symptoms such as diarrhea. Those who survived more than two months generally recovered to live somewhat normal lives.

For those who serendipitously found themselves behind shielding, such as masonry walls, radiation injuries were minimized in even those victims who were relatively close to ground zero. If you weren't killed by the heat, the blast, flying objects, or fires that erupted after the damned things went off, well, the radiation wasn't a problem.

Other than that, it's thought that if you were  $\frac{3}{4}$  of a mile from ground

zero, in either of the Japanese cities, and fully exposed to the effects of the radiation blast, you had a 50 percent chance of living.

**Residual radioactivity.** Far behind these in importance is going to be residual radioactivity in the form of *fallout*. Elevated death rates due to cancers and birth defects in future years, along with other maladies, may become problems, but they will pale in comparison to the death and destruction that will take place in the first few minutes of a nuclear blast.

And as a historical aside, it's worth noting that both Hiroshima and Nagasaki are bigger and more vibrant cities today than they were before the bombings despite the fact that they were both ground zero for nuclear blasts.

**EMP.** The very least of the problems from nuclear terrorism will be electromagnetic pulse. All nuclear bombs generate EMP, which is only a danger to electrical equipment, and not a direct danger to humans. And though all nuclear bombs generate EMP, for bombs detonated in the lower atmosphere the range of the EMP is very short and the damage is only local. Really destructive EMP is the result of high-yield bombs detonated at very high altitudes, and this is not likely to be how a terrorist is going to set off a nuclear weapon.

## What happened at Hiroshima and Nagasaki

From the two bombs dropped on the Japanese cities of Hiroshima and Nagasaki we have a fair idea of what the effects of the detonation of nuclear bombs in a populated area would be. Both explosions were blasts in the 10 to 20 kiloton range, probably the upper limit of what to expect from a terrorist weapon.

- In those cities everything within about a one-mile radius was totally destroyed, with the exception of reinforced buildings, and even they had

doors and windows blown off and were gutted by fires. Flash fires, started by the heat from the blast, started as far as two miles from ground zero in Nagasaki. Heavy damage extended beyond that to a radius of about three miles in both cities.

- Though the two bombs were comparable in size, about four square miles of Hiroshima, directly under the burst, were completely destroyed (this is a circle roughly  $2\frac{1}{4}$  miles across), whereas in Nagasaki the area completely destroyed was about  $1\frac{1}{2}$  square miles (a circle about  $1\frac{1}{4}$  miles across). The difference in destruction had more to do with where the bombs exploded and the geography of the cities than with the bombs themselves. Hiroshima is a city that lies in a flat plain, so the effect of the blast traveled unimpeded across the countryside. Nagasaki, on the other hand, is a city of hills so various parts of the city were shielded or shadowed by the hills.

- In both cities all humans and animals within 1 kilometer (about  $\frac{6}{10}$  mile) of the blast died almost instantaneously.

- From 1 kilometer to about 2 kilometers (1.2 miles), there were still many deaths. Those that died also died almost instantaneously, but many others survived. However, the vast majority of those survivors were injured either seriously or superficially by the blast and heat.

- From 1.2 miles out to a distance of about 2.5 miles many were injured by the intense heat and flying objects.

- At five miles most of the injuries were from flying objects.

In Hiroshima, the layout of the city's buildings, their construction (mostly wood), as well as the flatness of the local terrain conspired to create a firestorm that razed much of the city and contributed to many of the deaths. But Nagasaki, due to its hilly geography and the layout of the city, did not suffer from a firestorm.

## How dangerous are $U^{235}$ and $Pu^{239}$ to terrorists?

The beauty of  $Pu^{239}$ , from the terrorist's point of view, is that, though of the 15 or so isotopes of plutonium only two are fissile (capable of being used in a nuclear bomb), the only one that is practical to use in a bomb also happens to be quite safe to handle.

There are four common ways in which radioactive elements decay. One is through fission, which is quite rare. The other three ways are that it can emit alpha particles (which are really just the nuclei of helium atoms that have been stripped of their electrons), positive or negative beta particles (which are positive or negative electrons), or gamma radiation (which is like x-rays). Some elements emit one of these when they decay, others emit a combination of them. There are also other decay particles we're not interested in here, such as neutrinos.

On a scale of how dangerous they are, alpha particles can be stopped by something as thin as paper. In fact, your skin serves as a good barrier to them. Beta particles can be stopped by a window pane. Gamma radiation is the stuff that causes cancer and, in sufficient quantities, can kill you.

$Pu^{239}$  is an alpha particle emitter. You could sleep with it under your pillow. From the terrorist's point of view, the plutonium that he can create the most destruction with is also the safest for him to handle and it can easily be transported by individuals without harm to their persons.

However, the downside of a plutonium bomb is the difficulty of constructing the bomb, of detonating it, and the fact that they are generally encased in  $U^{238}$ , which is a gamma emitter which is not safe to handle, and emits radiation which is detectable.

In both cities buildings were destroyed by either overpressure waves that resulted from the blast, fires caused by the heat of the blast, and fires caused by buildings that, though they were beyond the heat effects of the bomb itself, caught fire when they collapsed.

More fires were caused as initial fires spread.

People became casualties as a result of flash burns from the almost instantaneous heat generated by the explosion, the fires caused by the bomb, and blast effects that not only sent bodies flying but turned objects of all sizes into millions of missiles.

## What would happen in an American city

Such a bomb, detonated at the proper altitude, in the core of a dense American city could conceivably cause 100,000 deaths and perhaps up

to half a million injuries. The totals would depend on:

- the time of day (If set off in a city, people may be at work or at home in the suburbs.)

- the population density (The New York City borough of Manhattan is very dense with 1.4 million people living in 23 square miles. On a weekday, hundreds of thousands more come to the borough from other parts of New York, from New Jersey, and from Connecticut to work. Los Angeles, though it has a population of over  $3\frac{1}{2}$  million, is spread out over almost 470 square miles—20 times the area of Manhattan.)

- where the bomb was detonated in the city

- at what altitude (Airbursts are much more destructive than ground bursts, hence a terrorist may set one off near the top of a skyscraper or from a low-flying plane.)

- the nature of the local geography (flat, hilly, etc.)

### U<sup>235</sup> vs. Pu<sup>239</sup>

There are reasons the United States and other developed countries use Pu<sup>239</sup> as opposed to U<sup>235</sup> in their bombs. But the main reasons are, first, that U<sup>235</sup> is a naturally occurring element that is very rare while Pu<sup>239</sup> is man-made element made by subjecting more plentiful U<sup>238</sup>, the most common occurring isotope of uranium, to neutrons in nuclear reactors. Until the end of the Cold War, the United States made tons of Pu<sup>239</sup> this way every year. The second reason is that, while Pu<sup>239</sup> is harder to detonate in a bomb, once you start the fission, it undergoes the fission process much more efficiently, consuming more of the Pu<sup>239</sup> in the process. A U<sup>235</sup> bomb, on the other hand, is easier to get going, but the fission process is very inefficient and about 90 percent of the uranium is wasted.

The third reason is that, since bombs can be built with much less Pu<sup>239</sup> than with U<sup>235</sup>, the bombs themselves are lighter and missiles that carry them have longer ranges.

But there are also reasons why developing countries initially build U<sup>235</sup> as opposed to Pu<sup>239</sup> bombs. It is because, although U<sup>235</sup> is rare, to manufacture Pu<sup>239</sup> you must have a type of nuclear reactor called a "breeder reactor." In this kind of reactor you can literally actually produce more fuel than you are consuming by irradiating U<sup>238</sup> with neutrons to create Pu<sup>239</sup>. If you don't have a breeder reactor, and few countries do, you can't make Pu<sup>239</sup>.

A second reason is that the triggering device in a U<sup>235</sup> bomb can be quite crude. All you need to do is get enough of it in one place and BOOM. It's as if U<sup>235</sup> is just dying to go off. But the triggering device in a Pu<sup>239</sup> bomb is a technological marvel in and of itself. Neutron emitting isotopes of beryllium and polonium are introduced to enhance the production of neutrons required for fission, and the Pu<sup>239</sup> core must be surrounded by a layer of explosives (usually 32 separate little bombs) to be imploded precisely.

- the weather (Overcast or foggy weather will cut down the intensity and the range of the thermal radiation from the blast.)

Had terrorists placed a nuclear device in either of the World Trade Center towers, death would have been from the heat, blast effects, and the near instantaneous collapse of both towers. On September 11<sup>th</sup>, most of the occupants of both towers escaped in the first 10 or 15 minutes, saving tens of thousands. Few, if any, would have escaped from the buildings in a nuclear blast. Many would have died in other buildings, also, but survival would have been more likely due to chance. Most of the deaths would have been from thermal effects and blast. And other buildings in the area, though not immediately destroyed by the blast, would have been destroyed

by ensuing fires. Scores would have been gutted and most would have collapsed.

In Hiroshima and Nagasaki, underground bomb shelters with earth-covered roofs, which were directly below the burst, collapsed. But those a half mile away or further survived. From this we can gather that those in subways would probably survive, though collapsing buildings, smoke, and fires could cause problems including the possibility of asphyxiation if raging fires above ground pulled enough air out of the subway system to feed the flames.

Depending on the size of a terrorist's bomb, surrounding skyscrapers may be pushed over. Most likely, however, those not near the blast would not fall immediately, though deaths and injuries within them

would be extensive. Most of the damage would come from fires caused by the intense heat from the blast and secondary fires that come from short circuits and other things. Some of those buildings would eventually collapse due to fires, and most of those left standing would be damaged beyond repair.

Unlike being near ground zero, where (unless you're in a subway) death will be instantaneous and almost certain, a few blocks away your fate may be the result of dumb luck—good or bad. The further away you are from a blast, the more likely your fate will be tied to shielding or "shadowing" from neighboring buildings. It's quite likely that within a few blocks of such a blast there will be people who survive unscathed while people near them will be injured or killed by debris. And, most certainly, those shielded by buildings will not suffer the effects of ionizing radiation.

Those exposed to the light from the blast may be burned on only one side. In Hiroshima and Nagasaki, whether someone was burned through their clothes sometimes depended solely on the colors of the clothing they wore. Some people were badly burned through dark colored clothes while others standing next to them but wearing white clothing were relatively unscathed. Others wearing various colors of clothes found themselves burned in patterns that corresponded with the various lightness and darkness in the patterns of their clothes. In the meantime, even the way clothes fit determined how burns were dispersed. Tight fits tended to burn more than loose fits.

Given today's synthetic fabrics, it's conceivable that some people would find dark clothes melted into their skin from acrylics and such while the rest of their bodies will be relatively unscathed.

Different American cities, if targeted by nuclear terrorists, would suffer

## The power in a 1-kiloton bomb

To give you an idea of how much explosive force a one kiloton bomb has, each of the Boeing 767s that flew into the World Trade Center carried no more than 70 tons of fuel. A one-kiloton bomb explodes with the energy of about 14 fully-loaded 767s crashing. And because the one-kiloton bomb releases its energy faster, its explosive characteristics are enhanced. (Think of this as comparing the energy released from a tankful of gasoline over a week's driving as opposed to how the same energy would be released if the same tankful were consumed in a hundredth of a second. In the former case we have a week of pleasant driving; in the latter we have a gigantic explosion that would level your home, all from the same tankful of gasoline. Yet, it's the same amount of energy being released.)

A one-kiloton bomb exploding at the top of a skyscraper or in a small plane 500 to 1,000 feet above a crowded city could, depending on the geography and population density of the city, result in tens of thousands, if not hundreds of thousands, of deaths.

To get a larger radius of destruction you must increase the yield of the bomb. The radius of destruction increases roughly as the cube of the bomb's yield, so to get a radius of destruction twice as great as the Hiroshima blast, which was equivalent to 13 kilotons (13K) of TNT, the bomb would have to be about eight times more powerful, or about 100 kilotons. (Incidentally, estimates of both the Hiroshima and Nagasaki blast have run from 10K to 20K, depending on who's doing the estimating. I've settled on 13K for this column.)

different effects. An airburst over Los Angeles, for example, may see destruction over vast amounts of the city with numerous pockets that are relatively unscathed because of the numerous hills and valleys in that city.

In both Hiroshima and Nagasaki most underground utilities were undisturbed by the blast because it was an airburst. Where there were breaks, it was due to collapsing buildings. However, aboveground utilities, such as power and phone lines, were damaged or destroyed depending on how close they were to the burst.

In American cities, where many of the utilities are underground, a surprising number would probably remain in service. In areas where large buildings collapsed, such as on Manhattan, losses in service would probably be local.

Within minutes after a nuclear detonation, the biggest threats to human life will be fire and collapsing buildings. On September 11<sup>th</sup> most of the

victims died in the collapse of the towers. But we know from World War II that it is possible for whole cities to burn in a firestorm. While Hiroshima burned in a firestorm, Nagasaki did not. It was one of the reasons Hiroshima suffered more casualties than Nagasaki. Other cities, like Dresden, Germany, though they didn't suffer a nuclear detonation, also burned in firestorms.

A firestorm is usually the result of many smaller fires coalescing into one huge fire which causes an updraft so severe that it sucks air in from all sides. The air rushing in often has gale-force winds that prevent the fire from spreading. But the intruding winds continue to feed oxygen to the flames, and if strong enough make it difficult or impossible for those who have been injured to leave the area. Such a fire continues to burn until it consumes everything within the flames.

Whether or not an American city that was subjected to a terrorist

nuclear attack would be ravaged by a firestorm will depend on the weather, the layout of the city and the composition of its buildings, other sources of combustible materials such as gasoline storage, and the size of the bomb itself. In most American cities a firestorm would be possible.

## How do you keep yourself safe?

You don't.

Kevlar vests aren't going to save you if you're too close to an exploding nuclear bomb, and if you are downwind from the fallout, neither will lead underwear. As in lightning storms, the real defense is just not being close to a target. Figuratively speaking, you don't want to stand under the trees.

Other than just not being too close to ground zero, there is a pill you can take—a potassium iodide (KI) or a potassium iodate (KIO<sub>3</sub>) pill. One of the effects of a nuclear detonation is the creation of a short-lived radioactive isotope of iodine, that is quickly absorbed by the thyroid gland.

As this particular isotope (<sup>131</sup>I), with its half-life of roughly eight days, degrades, it causes potentially fatal damage (including cancer) to your thyroid gland. If you are downwind from the fallout you may be affected.

What the pill does is flood your body with iodine so it doesn't absorb any more. This blocks the absorption of the radioactive isotope. Within a few months the radioactive iodine will have disappeared from the environment because of its short half-life.

## Where terrorists may get a bomb

To get a bomb terrorists will either have to:

- get one already assembled
- get the parts for one and assemble it
- build one from scratch



All are possible, but it's just that some are more likely than others, and, of course, it's possible that they would get some parts prefabricated and have to make other parts from scratch. But no matter how they come up with a bomb, it would seem that they're going to have to have help from someone who's already done it.

There are unsubstantiated (and likely untrue) rumors that Osama bin Laden bought several of these suitcase-sized bombs for \$30 million and two tons of Afghan heroin. But Jamal Ahmad al-Fadl, a Sudan native and one-time bin Laden associate, testified in the 1993 WTC bombing trial that bin Laden had unsuccessfully tried to obtain uranium suitable for building a bomb for \$1.5 million.

The point is there are terrorists who are trying to obtain the material ( $U^{235}$ ) to make a basic uranium bomb, which they probably could assemble, or to buy a stolen or smuggled plutonium bomb already assembled.

The so-called "nuclear club" is made up of just nine members. Following each name is the date they detonated their first nuclear device:

- **U.S.** (1945)
- **U.S.S.R.—now Russia** (1949)
- **United Kingdom** (1952)
- **France** (1960)
- **China** (1964)
- **India** (1974)
- **Pakistan** (1998)

**Israel and the Union of South Africa** have no doubt built bombs, and may even have detonated one, but South Africa claims to have left the club.

Israel had its first nuclear reactor in the 1960s and began building its own bombs in 1968. No one is really sure just how many they have, but it's likely they are building three to five each year.

When the Yom Kippur War started, catching the Israelis by surprise on October 6, 1973, Israeli positions were overrun all along its borders. The United States had already

## How a thermonuclear bomb works

A thermonuclear (or hydrogen) bomb is triggered by first setting off a "conventional" atomic bomb. Though there are several variations on how a specific bomb is made, in principle here's how one works:

The atomic bomb is made with a hollow sphere of  $Pu^{239}$ . At the center of this sphere is a heavy isotope of hydrogen called tritium ( $H^3$ ). The  $Pu^{239}$  is encased in a layer of lithium deuteride. The neutrons from the exploding  $Pu^{239}$  compress the  $H^3$  and begin fusing it. The combination of fissioning  $Pu^{239}$  and fusing  $H^3$  turn the lithium deuteride into a mixture of another isotope of hydrogen, deuterium ( $H^2$ ), and  $H^3$ . The extreme heat from the fissioning  $Pu^{239}$ , which now exceeds 100 million degrees, forces the  $H^2$  and  $H^3$  to fuse together and create helium. It is this fusing of hydrogen at the center of the sun that makes the sun shine, and in a thermonuclear bomb it is this same fusing that creates an even more fearsome explosion than an ordinary atomic bomb.

Very often, the outer casing that contains the thermonuclear bomb is made from the more commonly found isotope of uranium,  $U^{238}$ . Neutrons released by the fusing deuterium and tritium also create extra neutrons. These are high energy neutrons and not the type used to split

$Pu^{239}$  or  $U^{235}$  nuclei. They will, however, split  $U^{238}$  nuclei and this fission produces even more energy.

Thermonuclear bombs can typically be made hundreds and even thousands of times more powerful than atomic bombs.

But just as  $Pu^{239}$  bombs are more difficult to make than  $U^{235}$  bombs, thermonuclear bombs are more difficult to make than  $Pu^{239}$  bombs. However, once you perfect the method of making a thermonuclear bomb, it is easier to make bigger and bigger ones than it is to make bigger and bigger uranium or plutonium bombs. It's also cheaper.

The consolation is that thermonuclear bombs are currently beyond the technology of what terrorists are capable of and may remain that way for some time. However, stealing them is not. And it is also conceivable that if some third world country does make one, they could supply one to a terrorist group.

Delivery of such a weapon to its intended target then becomes a problem, but because it is larger, the bomb doesn't have to be nearly as close. Such a bomb, if large enough, could be detonated while still on a boat in a harbor or while resting in the back of large truck, or even flown in a chartered plane. It would, for all practical purposes destroy a city.

stopped supplying them with arms because of their stand on nukes. However, on October 9<sup>th</sup>, Israel notified then Secretary of State Henry Kissinger of its readiness to use its nuclear weapons if Israel's fortunes got worse. The United States reopened the supply lines that day and Israel turned back the invasion.

It is thought today the Israelis have between 80 and 150 weapons. But at this point in time none of them are considered to pose a terrorist threat to the United States.

For a terrorist to get the bomb in the foreseeable future it would seem as though at least one of the countries in the nuclear club would have to be involved.

**Russia.** When the former Soviet Union began to disassemble, one of the first concerns was what was going to happen with all of its nuclear weapons? They had between 13,000 and 15,000 strategic nuclear warheads and another 30,000 to 40,000 tactical nuclear warheads in their arsenal.

All the Soviet's strategic weapons were concentrated in Russia, Ukraine, Kazakhstan, and Byelorussia, and the tactical weapons were just in Russia, Ukraine, and Byelorussia. With the breakup the Russians intended to pull *all* of the nuclear weapons back behind their own borders and we can only hope they kept track of them all.

But there were several complications. One is that Russia has fallen on difficult economic times and the military arsenal they once held represents one of the few hard cash exports that can be readily sold for Western currency. An individual or group could make one or two of the 50,000 bombs "get lost" during the accounting and try to use them to strike it rich.

In September 1997 *60 Minutes* ran a story in which former Russian National Security Adviser Aleksandr Lebed claimed the Russian military had lost track of more than 100 suitcase-sized nuclear bombs. The bombs are supposed to be roughly 24 by 16 by 8 inches. The Russians reject this claim, as do many American intelligence experts.

But that brings about another aspect of the problem. Even if all the bombs can be accounted for, there are thousands of scientists and technicians who worked on the Soviet nuclear programs. They've become unemployed in their own homelands. They need jobs, they can build a bomb from scratch, and there are people who'll pay them to do it.

There was an estimated 100,000 scientists and technicians involved in the Soviet nuclear weapons programs, including 3,000 who had the highest levels of expertise. Now quite a few of them are out of work and the ones who have jobs are getting paid in worthless rubles.

Since the end of the Cold War, there have been at least 175 detected attempts to get plutonium out of Russia, either by smuggle or direct theft. There's no way to know

whether any, which may have gone unreported, have succeeded.

But in 1994 three batches, amounting to a bit more than 12-ounces, of weapons grade plutonium (Pu-239) were seized in Germany. Theoretically, a bomb could be made from this amount. The good news is that its yield would be considerably less than a kiloton and not something that would impress an Air Force general in the Strategic Air Command. The bad news is that the havoc it would have caused would have been greater than that of the two planes that hit the World Trade Center. In fact, it's very unlikely that many of the people who were in either of those buildings could have survived the detonation of such a device.

The plutonium's source was immediately traced back to Russian nuclear weapons facilities.

**Pakistan**, which is roughly 97 percent Muslim, has the bomb. Apparently it has made its bombs from U<sup>235</sup> using what is called the "centrifuge enrichment" method.

The difficulty is in acquiring a suitable centrifuge, and because of problems in balancing such a centrifuge properly this has proved to be difficult or impossible for all but the most technologically advanced countries. To get around this, the Pakistanis simply stole the plans for such a centrifuge.

In 1997, Pakistan detonated six atomic bombs. It's thought that the sixth and last may not have been a uranium bomb, as all the earlier ones were, but may instead have been a plutonium bomb. If it was, it means either Pakistan is now making its own plutonium at a nuclear reactor in Khushab, in the Punjab province, or it found a source of Pu<sup>239</sup> from abroad.

Neither scenario is good. In the first, if Pakistan can manufacture its own Pu<sup>239</sup>, though the country is stable today there's no way to know which way that nation will go tomorrow and one day they could surrepti-

### The first three bombs

The very first atomic bomb exploded was a plutonium bomb nicknamed Gadget. It was detonated at the Trinity Test Site on what is now the White Sands Missile Test Range in New Mexico.

Little Boy is a uranium bomb that weighed about 9,700 pounds and dropped on Hiroshima. It exploded 1,800 feet above the ground.

Fat Man was a plutonium bomb weighing about 10,000 pounds and dropped on Nagasaki. It exploded 1,650 feet above the ground.

The yield of all three bombs are estimated to have been in the 10 to 20 kiloton range.

tiously become a supplier of the metal to terrorist groups. There are already extreme Islamic groups in Pakistan, and many of the Taliban volunteers came from Pakistan.

In the second scenario, if they purchased plutonium from abroad, it would seem apparent that so can others, including terrorist groups.

It's also thought that the same reactor at Khushab may be capable of creating tritium, one of the ingredients for a hydrogen bomb. If that's the case, then the stability of Pakistan may be one of the prime goals for the early 21<sup>st</sup> century.

The problem is not just that Pakistan's political picture could change, but it's more apt to have individuals sympathetic to the idea of jihad who may be willing to steal or smuggle a bomb out of the country. Of course, with probably no more than a hundred bombs, so far, they are probably much easier to keep track of than the tens of thousands the Russians have.

**India.** India detonated its first atomic bomb back in 1974. With tensions building between it and Pakistan growing, it detonated another six in 1998. India claims that one

of the bombs it detonated in 1998 was a low-yield thermonuclear bomb.

India is, at this time, one of the countries less likely to supply a terrorist group with a nuclear weapon. But theft cannot be discounted.

**Iraq.** In 1976 Iraq bought the Osiraq research reactor from the French. It was constructed outside of Iraq's capital, Baghdad. Its supposed purpose was as a reactor for making radioactive isotopes. In 1980 Iraq tried to buy 25,000 pounds of depleted uranium. This is the stuff you use to make plutonium (the bomb), not medical grade isotopes.

This was enough for the Israelis. In 1981 the Israelis flew American-made aircraft, F-16s, and in less than two minutes of bombing they leveled the reactor.

Other countries, such as the United States, the United Kingdom, France, China, Israel, and South Africa are low on the list of countries who may supply a terrorist group with an assembled bomb or the expertise to make one. But there is always the possibility of one being stolen, or of people with the expertise to build a crude one selling that expertise to the highest bidder on the black market. People have done stranger things for money.

## Can terrorists develop one themselves?

The problems with terrorists actually building a nuclear bomb themselves are manifold. The first is just getting the overall expertise to do it. This isn't something that some backyard tinkerer is going to do in his garage.

Procuring the fissionable material itself may be the least of the problem. As I said, the Germans intercepted Russian plutonium already.

Other than purifying uranium or plutonium to get weapon-grade material, making a detonator for a plutonium bomb may be the most difficult

part of employing a nuclear bomb. This isn't just a matter of lighting a fuse and standing back. One of the challenges for scientists working on the Manhattan Project, America's atomic bomb project during World War II, was making a trigger for a plutonium bomb. Detonators for them are really high-tech stuff. Unfortunately, making a trigger for a uranium bomb is easier. If they had enough  $U^{235}$  to fashion a bomb, they could probably make the trigger in a cave in Afghanistan.

A few years ago a shipment of detonators being sent to Iraq was intercepted. Making a detonator for a plutonium bomb was one part that even their best scientists didn't want to tackle.

Testing to ensure they are manufacturing a working bomb is a problem. Testing one is difficult to hide, even if the test is an underground test, as even they have a characteristic seismic signature that differs from that of earthquakes, volcanoes, and other natural phenomena.

## What can we do?

Detection of nuclear weapons on American soil requires both intelligence and technology.

The upside is that there are better and better detection methods for finding nuclear weapons terrorists may

have, and using these gadgets are not intrusive in the way that many of the federal government's solutions to combating terrorism are. They are not likely to infringe on the one thing that makes Americans unique: our freedoms. The way some of them work is that fissionable materials that make nuclear bombs work emit a certain spectrum of gamma radiation that proper equipment can detect, often at quite a distance.

$U^{235}$  and  $Pu^{239}$  are themselves very difficult to detect, because they emit only alpha particles which are very short range and easy to shield from detection. However, batches of  $U^{235}$  and  $Pu^{239}$  are never pure but often have other radioactive elements in them that are gamma emitters. Gamma radiation is very difficult to hide. Along with the impurities, the products  $U^{235}$  and  $Pu^{239}$  decay into are also radioactive and can be detected. For example, one of the decay by-

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products of  $U^{235}$  is protactinium-231 ( $Pa^{231}$ ) which, when it decays, emits alpha, beta, and gamma radiation. The gamma radiation is detectable. With equipment that is sensitive enough, this kind of radiation is detectable even with equipment carried on aircraft over a city.

One of the ways "prospectors" looked for uranium in the '50s and '60s was by flying over wide stretches of the American West carrying Geiger counters "tuned" to the narrow spectrum of gamma radiation emitted by certain radioactive elements.

Also, the detonation of nuclear devices are started using conventional explosives. More and more, conventional explosives are also detectable using modern equipment. And, once again, this kind of equipment doesn't seem to pose problems by tampering with our freedoms.

The downside is that these detectors, for either radioactive materials or conventional explosives, are not yet widespread.

The President wants to install a \$25 billion Anti-Ballistic Missile (ABM) System as a defense against missiles being launched by rogue countries or terrorists who somehow secure ballistic missile capability. The problem is that no banana republic is likely to strike at the United States in this manner and, within a few years, such

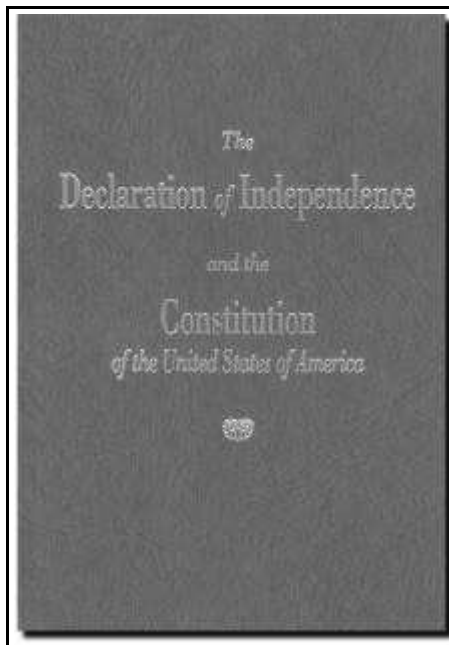
a system is likely to be obsolete anyway.

Far more effective would be money spent on good intelligence and the latest detection technology for the Nuclear Emergency Search Teams (NEST), a little known and somewhat secret agency established in 1975 under the Department of Energy. NEST's task is to search, locate, and identify devices or material that may be nuclear bombs. Though its personnel have been called out on numerous occasions, as far as the public knows, they have never found a nuclear bomb. And given the complexities of

making a bomb, it's probably an accurate assessment.

Currently working on a budget of about \$100 million a year, which is less than ½ percent of that projected to build an ABM system, NEST is the only realistic safeguard we currently have against terrorist nukes. In the opinion of this writer, NEST is grossly underfunded and, in light of September 11<sup>th</sup>, it is where this country should seriously consider placing more emphasis. Δ

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# Ask Jackie

Pickled hot peppers, sunflower seeds, dill pickles, preserving seeds, Brunswick stew in a jar, bitter milk, canning jam, and canning pesto

*I have seen red and green hot peppers in decorative jars of vinegar. I figure this is fairly easy to do. How do I do this? Can I use the vinegar in cooking?*

**Carol Chappell**  
*cchappell@glade.net*

There are two ways to use hot peppers in vinegar; fresh and dried peppers. While either will keep in an unsealed jar of vinegar, it's considered safe to only use dried peppers in unsealed jars. You should can the fresh peppers in vinegar.

To make your decorative (unsealed) jars of vinegar with dry peppers, nearly fill the jar with the vinegar of your choice (some folks opt for wine vinegars) and add dried red and green peppers. You can carry this one step further by drying your own peppers. Simply select thin walled peppers and string them up by the stem in a dry location.

Be sure that you end up with an inch or more of vinegar over the top of the peppers. Let steep for at least two weeks and yes, you can use this vinegar (now flavored by the hot peppers) in many recipes.

I also can pickled peppers of many types, which are very decorative, especially when put up in pretty antique canning jars. I've found a whole bunch at yard sales, county dumps, and lying about in pastures. Just be sure they have no cracks or nicks in their rims.

## Pickled peppers:

1 gallon mixed hot peppers of your choice
1½ cups salt
1 gallon water
1 cup water
5 cups vinegar

Wash and drain fresh peppers. Cut two small slits in each pepper. Dissolve the salt in the gallon of water. Pour over the peppers and let sit over night. Drain and rinse. Drain again.

Add 1 cup water to 5 cups vinegar. Simmer 5 minutes. Pack peppers into hot, sterilized jars. Heat the water-vinegar mixture to boiling and pour over peppers to within ½ inch of the top. Wipe the rims. Place lids on and screw the rings on firmly tight. The jars will seal as they cool.

If you use decorator lids and rings or add a ruffled cap of gingham, over a regular lid, screwing down a new ring and tying a matching ribbon below it, you have a wonderful, sealed gift. You can certainly use this vinegar, as well, in your cooking.

**Jackie**

*Every year my husband grows sunflowers. However we have never figured out how to properly dry them and salt them. Could you help us with this? Also, we would like to know how to prepare BBQ flavored sunflower seeds.*



**Jackie Clay**

*P.S. The husband has a question! How do you prepare seeds for next year's garden; storage, preparation, handling. I've tried to preserve seeds in the past, but they always end up rotting.*

**Jana Evans Williams, OR**

Sunflowers are a great addition to the back of any garden or in a patch of their own. They are so easy to grow. To harvest the seeds (for yourselves or to feed the birds), wait until the petals have dropped from the sunflower and the seeds are the right color. (Sunflower seeds come in striped, black, white and even red. It depends on the variety you grow.) Then cut the head and a few inches of stalk off with a sharp knife or garden loppers. To dry the head, tie a pair upsidedown over a rafter in the attic or garage, out of mouse, chicken or bird reach. Repeat until all heads are hung. This way the seeds will dry, not mold and rot as they will if you simply cut the heads and put them in a pile or in a box. When crispy dry, you can harvest the seeds for any purpose. We staple half inch hardware cloth firmly on a two by four frame, which fits down over the top of a clean bar-

rel or garbage can. Rub your dried sunflower heads over this screen and your seeds will shuck out and fall into the can below. You will get some debris from the sunflower head, but this can be winnowed out by pouring the seeds from one container to another in a stiff breeze.

Once your sunflower seeds have been cleaned, stir the contents of the can once a day to ensure that they dry perfectly. They are now ready for next year's garden seed. You can store your seed in any moisture and pest proof container until spring.

To salt your seeds, mix up a heavy brine of 1 cup of salt to 2 cups of water. Boil to dissolve the salt completely, stirring the mixture. Then dip a cup of seeds out and drop them into the salt brine, stirring to coat them. Dip the seeds out with a slotted spoon and place in a single layer on a cookie sheet. Bake in a 225° oven until the seeds are dry and you see the whitish salt on the toasted seeds. You usually have to slightly stir them with a fork to be sure they dry completely; you aren't baking the seeds, you are only *drying* and *toasting* them.

Use the same method for barbecue flavored seeds, using barbecue flavored salt, instead of plain. To get a stronger barbecue flavor, you may have to sprinkle salt on the wet seeds while on the cookie sheet, depending on the flavored salt you use.

**Jackie**

*My husband asked me to inquire about the possibility of canning dill pickles that would taste similar to those we purchase at our local grocery market. I have refused to attempt this as of yet because I recall several failed attempts by my mother. The dill pickles she produced can only be described as "nasty," even though her sweet pickles were very tasty. Is there a fail-safe procedure or recipe you can recommend to us?*

**Mrs. Sean Evans  
Williams, OR**

Most failures in dill pickles result from the long method, where dill pickles are brined in a large crock. While this can result in very good pickles, sometimes one forgets to skim the scum that forms on top of the brine every day or doesn't get the top plate, which holds the pickles under the brine weighted down enough to keep the pickles covered with brine. The result is mushy, nasty pickles. Try this quick dill method which is the one I most often use. (I've no time for scum skimming.) I think you and your husband will enjoy them.

**Fresh-pack dill pickles:**

18 pounds of 3 to 5 inch cukes  
1½ cups plus ¾ cups salt  
2 gallons plus 9 cups water  
6 cups vinegar  
¼ cup sugar  
7 small dry pods hot pepper  
2 Tbsp. pickling spice  
⅓ cup mustard seed  
7 cloves garlic  
21 heads of dill or  
1 cup dill seed

Thoroughly wash, rinse, and drain the cucumbers. Cover them with a brine made of 1½ cups salt and 2 gallons cold water and let stand overnight. Rinse and drain the cukes. Mix the vinegar, 9 cups of water, the remaining ¾ cups salt, sugar, mixed spices (tied in a cloth bag), and heat to a boil. Keep hot. Pack cucumbers to within half an inch of the top of quart jars. Put 2 teaspoons mustard seed, 1 clove peeled garlic, 3 heads of dill (or 1 tablespoon dill seed) and 1 pod of pepper in each jar. Cover cucumbers with hot pickling liquid. Wipe rim. Put on hot, previously boiled lid and screw down ring firmly tight. Process 20 minutes in boiling water bath. Makes 7 quarts.

You can adjust this recipe a little—you may omit garlic or increase it a little, omit the hot pepper or increase—according to your family's

taste. Try a batch and make notes to yourself for next time. These pickles work well every time. Use pickling salt, not iodized salt and be sure you use fresh cukes, not ones that stood around after harvest.

**Jackie**

*I would like to know how to can Brunswick Stew in a jar. The stew will be already cooked.*

**Lydia Wood  
wrwood@csranet.com**

Heat your Brunswick Stew using chicken, tomatoes, butter beans, onions, potatoes, and spices to boiling. Pack stew into clean jars to within one inch of top of the jar. Wipe the rim. Place a hot, previously boiled lid on and screw down the ring firmly tight. Process quarts in a pressure canner at 10 pounds pressure (adjust pressure upward if you live above 1,000 feet—see your canning manual) for 75 minutes. When making stews to can, I add vegetables, such as carrots and potatoes, after the stew just boils and heat just til it reboils. Then I pack the stew. This way the vegetables don't get mushy as they sometimes do if you completely cook the stew and then pack it.

**Jackie**

*I have just started milking and the flavor of the milk is bitter. I pasteurize but the odor, smell, and taste were there before I pasteurized. It must be what she is eating because I can smell the same odor on her breath when she chews her cud. Any ideas? I am very disappointed since I planned to make cheese, butter, ice cream, etc.*

**Deb Hemingway  
d-dfarms@lakes.com**

Well, Deb, let's find out why your milk is awful so you can fix the problem and get to those dairy goodies. My first impression is like yours; it very well could be something she is eating. To test this theory, pen her up

in a dry lot for a week, only feeding hay and a corn/oats mixture. Some dairy animals cannot be fed molasses, as their milk gets an off flavor.

After a week, check the flavor of the milk. If it is now good, you know it definitely was something she was eating that affected the taste of the milk. If her dairy grain has molasses, add that back to her diet. Then check the milk. If it is still good, you know it wasn't that.

Walk her pasture and look for plants that could cause off flavored milk; wild mustard, anything in the cabbage family (kale, rape, etc.), wild garlic, wild onions, etc. Break plants off and smell them. If you notice "that" odor, you know you have the culprit. You will now have to rid your pasture of that plant or keep her fenced off patches of the culprit.

Another cause of off-flavored milk is low grade, chronic mastitis. This often shows up at freshening and is characterized, in many cases, as only a few "creamy chunks" caught in the milk filter. Mastitis can be treated by milking the udder completely out several times a day and treating her with intramuscular antibiotics.

If the diet did not cause the problem, talk to your veterinarian. There are several problems, including mastitis, that can cause bad flavored milk. She may need a check up.

Is your dairy animal a goat? If so, some does produce "goaty" flavored milk. This can usually be corrected by giving free choice baking soda in a pan in the feed trough. After several days you will often notice good, sweet milk just like you dreamed of.

Your trouble is not rare, but it isn't common either. I'll bet with some sleuth work you can find the problem. Good luck.

**Jackie**

*A friend and I canned 53 jars of strawberry jam two days ago and it's not set up the way it should. It's a bit runnier than we think it should be.*

*What alternatives do we have to salvage the berry mixture? Neither of us really wants 53 jars of strawberry syrup.*

**Joan Dove  
Aberdeen, WA**

Hopefully, all you will need to do is to wait a few weeks. Strawberry jam sometimes takes that long to become as firm as you'd like. But if not, what I would do is to open one jar at a time, as you need it, dump it into a saucepan, bring to a boil and add one tablespoonful of strawberry gelatin powder. Stir until it is completely dissolved and pour back into the washed, rinsed, still warm jar. (This is one application where you can re-use the lid.)

Set this jar into the fridge when cool, and keep it there after opening. I'm assuming you used pint or half-pint jars. If you used quart jars, use two tablespoons of gelatin. I've done this with good success. You may have to adjust the gelatin a bit, but after the first jar, you'll have it down to a fine science. The jam will be set perfectly and will taste no different.

Causes of runny jam and jelly are: not enough powdered pectin to the batch, too much sugar, not boiling the mixture long enough after adding the sugar, and cooking up a double (or larger batch). Luckily, it's still all edible.

Still, remember to make use of some of those jars of "strawberry syrup." We love strawberry syrup drizzled over homemade vanilla ice cream or an angel food cake.

**Jackie**

*Can you home can pesto? I assume that you can, since you can buy it in cans at the store, but I don't know the processing time. I have canned baba ghanooj and so on when overseas, but didn't know if there was a trick with pesto.*

**Nadine  
nzanow@thecia.net**

Anything you find canned in the store can be home canned, but several items, such as pesto will not be found in your home canning manuals. The only reason I would not recommend canning pesto is that it is so much better made fresh with basil from your own herb bed. Those delicate flavors will not be as perfect if you can it, which of course, must subject it to heat.

But if you want to can it, I'd recommend using half-pint jars; you don't want leftovers. Using your favorite recipe—typically basil, peeled cloves of garlic, and olive oil, crushed well together—pack it into clean jars to within half an inch of the top. Wipe the rim, place a previously boiled, warm lid in place, and screw down ring firmly tight. Process at 10 pounds pressure (adjust the pressure upward for higher altitudes; check your canning manual), for 45 minutes.

**Jackie**

*I canned some raspberry jam 3 weeks ago and some of the jars didn't seal. Are they good to eat, or should I throw them away?*

**Rita LaPointe  
Santa Rosa, CA**

Unless the jars are moldy or smell fermented, they are fine to eat. I would keep them in the fridge until you use them, as they could mold or ferment. But jam will not cause "food poisoning."

To prevent sealing failures in the future, be sure you process the jars of jam in a boiling water bath after screwing down the rings. This eliminates 99% of failed seals in jams and jellies and is why I always do it.

**Jackie**

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# Letters

(Dear Readers - Thank you for writing to Backwoods Home Magazine. The opinions and suggestions we receive from our readers are very important to us. We regret that we are no longer able to print or individually respond to every letter received due to the volume. We do read every letter received, and pass them along to the editor or writer concerned. We print a selection from our mail that best represents the views and concerns of our readers.

— The Editors)

## Applause

*Damn! This is a good magazine!*

David Overby, Peosta, IA

*I think you have a great magazine! Yours is the only publication we subscribe to as we try to watch our funds.*

*Just wanted to let you know we think you're great and keep up the good work.*

Ed & Mary Fowler, Delta, IA

## \$10,000 home

*We built our own home for a little less than \$10,000 including septic system and bldg. permit. The building permit cost us \$1,250. We're in a remote area (our driveway is 3.5 blocks) and we plan to use solar panels and a wind mill. Now, we use a homebuilt 12v charger and batteries. Anyhow, I'd definitely build my own home! Or, you can pay around \$800 a month for 30 years...\$288,000! It took us two years, part time and all spare time spent buying stuff and building but we made it by ourselves for ourselves and with a handsaw and shovel and a plan and some books...like this one!!*

*Trust me. Daniel Boone was a man.*

*Also, we're buying a soapstone stove from Woodstock Soapstone. They have been excellent in all ways. And they advertise in Backwoods. Colleen Doolittle has been very helpful.*

Tim & Joanne King, Pegram, TN

## How ready am I?

*I found this cover question quite teasing, as I anticipated finding some sort of quick guide or test between the front and back covers. But then who would want to buy the "Emergency Preparedness and Survival Guide" if you were just giving the information away. In response to that question, I respectfully submit the following. You be the judge, "How ready am I?"*

*I have been considering the question of "What if?" for a little over eighteen years now. I recently retired from the military after twenty years, and chose to settle in the northern Rocky Mountains for several reasons; ample natural resources, sparse population, low crime rate, relatively free of natural disaster events (earthquakes, flood, hurricanes, tornadoes, etc.), and a sense of well...good neighborliness among the people here.*

*I have a very good supply of food. I would estimate about a year's worth conservatively, not taking into account the additional sources of game animals and fish, plus this is cattle country and it pays to have a few ranchers as friends. I also have a greenhouse and a garden, even though the growing season is short here in zone 4, I have determined what I am able to grow and plant accordingly. My wife and I had quite a crop this last year; potatoes, green beans, carrots, onions, sweet corn, cabbage, tomatoes, peppers, cucumbers, spinach, beets, and horseradish. In addition to our garden we have a strawberry patch and a couple rows of raspberries. Our fruit trees include 7 apple, 2 pear, 3 plum, 2 apricot, and 2 cherry. Everything is best fresh, however what we don't eat fresh, we can, freeze, cold storage, or dehydrate. The cabbage is usually made*

*into sauerkraut. My wife is German and her sauerkraut is the best.*

*We live outside the city limits and have a well for water, plus there are several sources of surface water in this area.*

*I also have a good supply of sundries—toilet paper, disposable razors, soap, shampoo, etc...I have found not many people think of these items.*

*It gets a little chilly here in Montana, I have seen -40 with no wind chill. To me that is also a plus because only the serious hard core survivalists will stay around for that, and they are my kind of people. I have wood stoves for heat and cooking, Coleman & propane stoves for cooking and canning, oil lamps, candles, & propane lanterns for light, and two generators, one is a 5kw 120v 30amp/240v 20amp AC with which I am able to power the pump for my well & other things and the other is a 1.8kw 120v 20amp AC / 12v DC which I will use to power the blower motors on the wood stoves, some lights and select appliances as necessary. I store and rotate my supply of gasoline in 55 gal. drums (with Stabil additive). I will not get into specifics, but I have enough to get by for awhile.*

*As far as security goes, as I stated earlier, I served in the military for twenty years, I know a few things about security and tactics. I have two dogs for early warning and deterrence, not to mention detection devices, night vision optics, various firearms (the right tool for the right job), and a sufficient amount of ammunition for each plus. In choosing the specific firearms I own, I have taken into account short, medium, and long range, standardization, and availability of ammunition (.22 cal. Rimfire, 9mm, .223 Rem, .308 Win., 12 Ga., and .300 Win. Mag.) no wildcats. I also reload ammunition. As a last resort I also have blackpowder rifles, pistols, and shotgun.*



*My vehicle—a late 70s Chevy Suburban 4WD 350 cu.in. V8 (w/ a spare 400 cu. in. engine if needed), good on gas? Not really, but it hauls a lot of cargo and you don't have to be S.A.E. certified to work on it, NO COMPUTER. Besides, when the deification hits the rotary oscillator, where would I need to go?*

*Medical supplies—the basics plus a little extra. I was able to attend a combat lifesaver course while in the military, and I keep current on basic first aid. I am a firm believer in herbal medicine as a supplemental source of healing. I don't stock a pharmacy of herbal cures, however I do stock seeds for numerous medicinal herbals that when necessary, can be cultivated, and using the herbal references I have, be used in traditional healing. They will take time to grow, but it's better than nothing.*

*I have a shop building heated with an Earthstove Log Furnace that, serves as storage, reloading area, dry warm workplace, and fabricating dept., complete with wood & metal-working tools. I have the ability to fabricate or repair items that could be used in trade.*

*The best thing I have is a good wife, and a few good friends that think the same way I do. They believe that the Constitution of the United States is not a living document, open to interpretation by every liberal judge or politician, and that the Bill of Rights are individual rights, not collective privileges given to us by the government.*

*I enjoy reading BHM each month. You folks do an outstanding job!*

Name withheld by request

## **I wanna meet Mac**

*...My reading sequence when BHM comes is: 1. My view 2. Irreverent Joke page 3. Ayoob (who I've read for years...) 4. Think of it this way. (And when you put out a complete anthology of John, Mac, and Dave—I'll buy it.) And I wanna meet Mac!!*

*"My view" caused me to finally join the LP. I've been a Libertarian all my life of course.*

*I am amused by your "backwoods" mag with all of you managing to survive with computers!—We live very comfortably with: no computer, no TV, no "news" paper or answering machine—and **no ulcer!***

*This clan loves you!*

Ralph Dexter, Marblemount, WA

## **ASG subscriber**

*Thank you for taking over and fulfilling my subscription to the now defunct ASG/SRJ with issues of your worthy publication. After reading the last few issues, I had been inclined to subscribe. Today, I received your excellent and most informative special preparedness issue. This is what I needed to resolve the matter and send a check and formally subscribe. Again, thanks and best wishes.*

Edward Di Bella, San Diego, CA

## **Freedom, independence, & self-sufficiency**

*I am a relatively new reader of this magazine. After reading "The last word" in the Jan/Feb 2002 issue of BHM, by Don Fallick regarding his mid-adventures and being mistaken for a terrorist, I wanted to give him a heads-up. Provided of course that he hasn't beaten me to it.*

*I read a book my father had, now on loan to a nephew, entitled "Into The Wild," (I think). Anyone who fancies himself a survivalist needs to read this book. If Mr. Fallick has already read the book, I hope he found it as enlightening as I did.*

*I enjoy Mr. Ayoob's writings on firearms. I grew up around firearms, and there was never any question of being careful with them. I taught my son how to use and care for firearms as soon as he was physically big enough to hold a .22 handgun. Being careful and responsible is now second nature with him regarding not*

*only firearms, but many other potentially dangerous objects.*

*Freedom, independence, and self-sufficiency go hand in hand. Responsibility also is a characteristic too often found lacking in today's society. Here's wishing you a long and successful magazine.*

Cameron Triplett, Sr.  
Brooksville, MS

## **So what...too bad**

*I agree with you that many Moslems don't like us because we support Israel, because we meddle in their affairs, and because we're over there.*

*So what. Too bad. We shouldn't change our policies because someone doesn't like them or us.*

*Israel needs our support. She is surrounded by enemies who want to destroy her.*

*We meddle in middle East affairs and are there to keep the oil flowing. It is in our national interest.*

*I suppose next issue we'll read about the Germans not liking the Versailles Treaty and the United States isolating Japan causing the attack on Pearl Harbor.*

Chuck Stepniak, Stephenson, MI

## **The coming American dictatorship**

*I just read "The coming American dictatorship." How interesting a world you want to live. You want to live in a "Do as I want, when I want and how I want" world. Everyone else be damned. I bet your secret hero is Jane Fonda. Come on admit it. You LOVE her don't ya. So where do all the vets who in service to this country become disabled? Do they not have any right to enjoy life as they had before their disability? Do they have a God given right to eat at the same restaurant as you? To participate in going to football or baseball games like you do? Guess not...*

*Now about the EPA...You like to hunt? Fish? Go boating or canoeing? Do you like going outside without a*

respirator? Obviously not. You would rather be rid of the outdoor related industries so that ACME Chemicals can do as they please.

No in your world smog is king. An earth sized parking lot is queen. Rights for the few...slavery for the rest. A world where life is cheap. This is what you folks want...Well you ain't gonna have it so deal with it.

Ike, cheesemonkey67@earthlink.net

## Our fault?

My next issue, #74, which ends your "ASG" obligation, is the last due me. And after reading "My view" by John Silveira in issue #73, it may well be my last altogether. I am very disappointed....the implication, explicitly put in his editorial comment, that it is our fault, I reject completely. Our (USA) involvement ("meddling" according to John) in Britain, western Europe, and Japan after World War II immensely aided in their economic and social resurgence.

The problems do not arise from the Muslim (or Islamic) masses. As you so succinctly and pertinently pointed out, John, it's the result of agitation that has been incited by a group of idle, amoral, RICH KIDS! Bored and with no other responsibilities than to spend their unearned money, they turned to terrorism and assuage their fragile egos. The additional point that they are all cowards goes without saying.

Am I angry? You're damned right! My hard-earned dollars indirectly support these slugs through oil revenues, etc. I don't have much choice, but I don't have to like it.

Have we (USA) always been right? No, not at all. A good example was our involvement in stopping Israel's incursion into Lebanon in the 1980s to quash the PLO. Israel had the upper hand and was progressing quite nicely until we (USA) "meddled." None (zip, zero, nada) of the Islamic states where the PLO sought sanctuary would accept them. Not

until Jordan, who had previously kicked out their sorry butts, agreed to take them. Where, John, were all of your idealistic young Middle Easterners then?

No other ethnic group has ever been persecuted as much and as long as the Jews. Tell me, John, how many pogroms have there been against Palestinians and Arabs? I'm not a historian, so please give me some enlightenment. I'd be very interested in exactly how any data you have or can give me stacks up against the historical record of purges, oppression and pogroms aimed at Jews for countless centuries.

Another huge example of one of the errors in our foreign policy (meddling?) was our treatment of South Africa during its period of racial conflict. We (USA) ignored the fact that in spite of its (South Africa's) policy of apartheid, it was the only nation on the African continent that blacks were striving to get into!...

...With no regrets and no sorries, I totally reject what you expressed in "My view" in issue #73 of BHM. As I said before, the cause of September 11, 2001 is a group of spoiled, indolent, bored, amoral rich kids....

...Now, John, answer this, if you can. How many countries of the world have rushed to give us aid during natural disasters (flood, etc.) or during calamities like Oklahoma City or September 11, 2001? Well, I know: NONE! Nothing tangible at all. Further, how many times have we, our government and private agencies, rushed to the aid and comfort—tangible—of other countries in disastrous and calamitous situations? John, there is NO contest! Should we stop this sort of "meddling"?...

...Sorry if I sound, or seem, confused. I just don't understand the tone of your article. And I don't feel any sort of responsibility for "bringing it on ourselves." We didn't! They did! And, also, I am rather tired of the voluminous protestations of Muslim

clerics and other Islamic spokesmen. They declaim against the terrorists of 9-11, but do nothing substantial against the terrorists message.

You really should reassess your memories about your noble, abused Middle-Eastern contemporaries during your youth. It was, or they were, the upper and middle-class wealthy and educated speaking so that made it right? Get a life, John. Get down in the dirt with those of us who work for a living. I, for example, have been the following: theater usher, dairy factory employee, electronics technician, soldier, steel factory employee, steel factory foreman, railroad employee (gandy-dancer and clerical) and retail sales.

As with most lower class and lower middle-class types, I have worked hard and I have worked easy, but I have worked. And don't give me the one about "intellectual" work being as hard as physical work. It just doesn't fly and it's not true. You should get out, or should have gotten out, among the masses before you formed your opinions. Then, not now after the illiterate masses have been brain-washed.

I apologize for running on so long. But "My view" in issue #73 really pushed my buttons. I have re-read it several times and my initial conclusion remains. I generally like BHM, but if "My view" in any way represents its editorial slant, then I will sever all connections...

...Finally, John, crawl out of your intellectual ivory tower and smell the sweat. Oh, you probably did many sorts of menial work in your youth. But get with the ones who do 'em for a living!

Roy Whittum, Eaton Rapids, MI

**Want to put your 2 cents in?**  
**Send letters to:**  
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# The last word

## Silveira's 1st law: Every group *needs* a black sheep

I used to play a lot of poker and I learned things about people that surprised me. They were things other than the “Know when to hold ‘em, know when to fold ‘em...” stuff Kenny Rogers sang about. They were things about the ways people get along with each other—whether they were in a poker game or not.

I usually ran the private games I played in and I felt *everyone* had to be on his best behavior for “my” games to stay together. My financial health depended on it. But it was frustrating because there was always someone in the games who was the model of bad behavior—the black sheep. What dawned on me one day was that the games not only stayed together in spite of the black sheep, they stayed together *because* of the black sheep. He was what made the other players *conform*. No one else wanted to be the black sheep. I began to realize how important the black sheep was to the health of my games. And subconsciously I think the other players realized they needed him, too. The black sheep made it so the rest of us got along. No matter how much complaining the others did about him, I never remember a time the players expelled a black sheep from the game.

My next surprise was realizing that if the person who was usually the black sheep dropped out of our game, it soon devolved to another person to become the model for bad behavior—the black sheep. The role of the black sheep really started to make sense. But later on, when I extended my poker horizons, I noticed that games in public cardrooms sometimes had a black sheep, but more often didn't. When I looked closer, I realized that when there wasn't one it was always when the players didn't know each other. But if it was a small cardroom, and it was more or less the same players night after night, there was *always* a black sheep, just like in the home games. I realized that because they need a black sheep to ensure the good behavior of the others in the group, the black sheep is not only indispensable, sometimes he's the most important person—to ensure the health of the group. To ensure the others bonded.

But what was even more surprising was that outside of the game, the person who was the black sheep might not be anything like he was in the game. He could be perfectly reputable. He only filled the black sheep role for the moment.

I began to wonder if I'd see this phenomenon other places. I did. Weddings, funerals, family reunions, classrooms, the job, and even sports teams seem to need to have someone assume the role of the black sheep. As long as people in the group know each other and they have to interact, there's going to be one to ensure everyone else behaves.

I took an honest look at myself and I realized I was often the black sheep, particularly back when I was in school, growing up in my family, and, as an adult, even on the job. Those times when I ignored the role, it devolved onto someone else, even if I'd been the black sheep before. And I realized you have to accept that role for it to work. And everyone fills it differently. We all have our own style. The important thing is, you must do it so no one else wants to be like you and everyone else conforms to the “proper behavior.”

I also realized that some may appear not to want the black sheep role and they become defiant. They get that “you can't tell me what to do” mentality. But watch them closely. They're now the star. Many who seem to actively resist the role often relish the attention they're getting as they act out. Some of these people make it their life's purpose to always be the black sheep no matter what the occasion. They're making a career out of it. You know the kind of people I'm talking about.

Finally I began to realize that we even invent fictitious black sheep whose purpose is simply to ensure good behavior in society. It starts in childhood. No one wants to be the boy who cries wolf. And we learned the lesson of Little Boy Blue that, when he fell asleep, the sheep got in the meadow and the cows got in the corn.

Some people are better suited to being the black sheep than others, and it often depends on the function. In the poker games I was *never* the black sheep. I was the guy who kept the game moving, admonishing players to pay attention, keep the action going. Yes, admonishing the other players. I had a hand in determining who was to be the black sheep without even realizing it.

And when I wondered what there was in it for he who becomes the black sheep, I again looked at my own life experiences and it dawned on me that, while being “one of the others” in the group fosters security, being the black sheep bestows privileges. As I said before, it very often meant being the “star.” It conferred a certain amount of freedom on me that others in the group didn't have, and I like freedom. I got to be funny in class, I could show up late at work, I could sleep anywhere. Because I was the black sheep, this behavior was expected of me. But I also discovered girls like “bad boys,” and being the black sheep I got girlfriends without being a jock. Being the bad boy has its perks.

So, next time you're in a group where the people have to interact, look around. If they're together long enough, someone will become the model of unacceptable behavior. Watch that person and you'll know what *not* to do if you want to fit in. And, if you find yourself being pushed into that slot, remember that you can refuse it by ignoring it. On the other hand, being the black sheep has its perks. If you're smart, you can milk it for all it's worth. I do. Δ

— John Silveira